

Marine Isopod Crustaceans in the Sagami Sea, Central Japan

By

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Abstract: Marine isopod crustaceans were investigated based on the specimens collected during the project “Study on Environmental Changes in the Sagami Sea and Adjacent Area with Time Serial Comparison of Fauna and Flora” carried out by National Science Museum, Tokyo (NSMT), and those deposited at the Showa Memorial Institute, Tsukuba Research Center, NSMT and the Toyama Science Museum. The examinations of specimens dredged in 2001–2005 and collected from the inter-tidal zone in 2003–2005 resulted in detection of 46 species of 12 families from 5 suborder of marine isopods. Eight new species, *Cyathura sagamiensis*, *Mesanthura cinctula*, *Arcturus hastatus*, *Neastacilla spinifera*, *Neastacilla scabra*, *Pentias namikawai*, *Tridentella takedai* and *Ceratothoa curvicauda* were described.

Key words: marine isopods, Sagami Sea, new species, taxonomy, fauna

Introduction

Sagami Bay is located southwest of Tokyo and influenced by the Kuroshio Current directly, hitherto, relatively large number of isopod species have been reported from the sea. But occurrence of many additional species have been expected to be recorded from the area, judging from richness of many other animal groups. During the faunal survey entitled “Study on Environmental Changes in the Sagami Sea and Adjacent Coastal Areas with Time Serial Comparison of Fauna and Flora” carried out by the scientists of National Science Museum, Tokyo (NSMT) in 2001–2005, many marine isopods have been collected from the continental shelf. As to the intertidal species, I carried out collecting trips three times: Miura Peninsula, in 2003, Oshima Island, Niihima, and Kozu-shima Islands in 2004, and the east coast of Izu-Peninsula, in 2005 (Fig.1). I also examined isopod specimens deposited at the Toyama Science Museum. Adding these, I could examine of a series of isopod specimens deposited at the Showa Memorial Institute, Tsukuba Research Center, NSMT. At the results of the survey, 46 species belonging to 33 genera 12 families were recorded and eight species were proved to be new to science.

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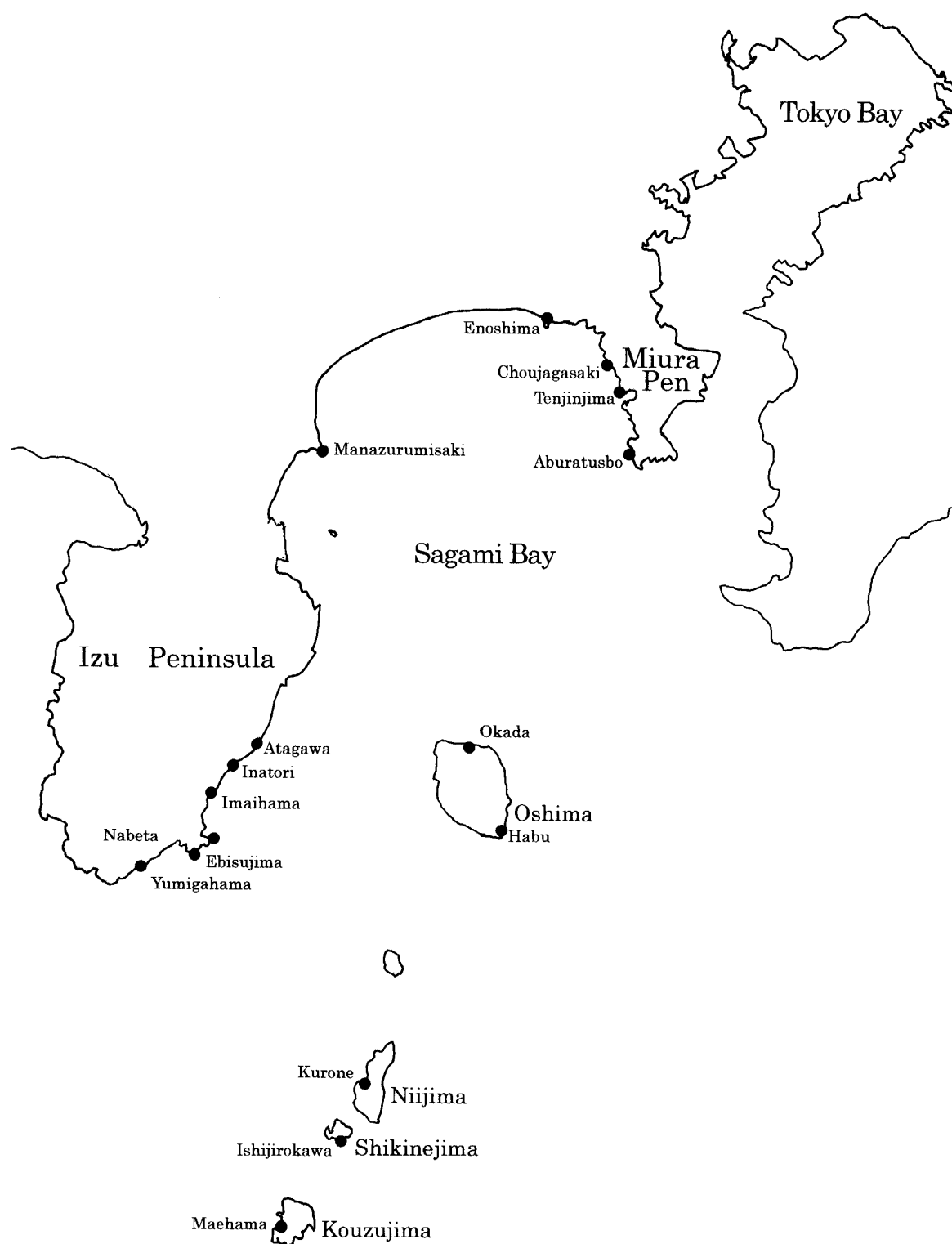


Fig. 1. Main sampling sites of shore collecting.

All the holotypes and a part of paratypes are deposited at the Showa Memorial Institute, Tsukuba Research Center, NSMT (NSNT-Cr S) and some paratypes at the Toyama Science Museum (TOYA Cr-) and some other museums.

Classification

Order Isopoda

Suborder Gnathiidea

Family Gnathiidae

Elaphognathia cornigera (Nunomura, 1992)

Material examined: 72 ♂, 15 ♀, 13 youngs, Yumigahama, Minami-izu, 4 June, 2001, coll. Katsuhiko Tanaka.

Gnathia nipponensis Monod, 1926 [New Japanese name: Nippon-umikuwagata]

(Fig. 2)

Gnathia nipponensis Monod, 1926; Monod, 1926, p. 378, figs. 149–150.

Material examined: 3 ♂ (2.8–3.3 mm in body length), North-east of Jogashima, Miura-shi, Sagami Bay, 60 m in depth. The specimens are deposited at Showa Memorial Institute, NSMT.

Description of male: Body 3.0 times as long as wide, excluding mandibles. Cephalon rectangular on quadrate, lateral margin parallel. Eyes relatively large and each eyes composed of about 40 ommatidia. Pereon parallel, with width almost same. Pereon evenly-sided, as wide as cephalon. Pereonites progressively longer. Pleotelson elongated triangular, with two relatively long setae at the tip.

Antennule (Fig. 2C) six-segmented; distal four segments with one or two aesthetascs. Antenna (Fig. 2D) 12-segmented; five peduncular segments and seven flagellar segments. Mandible (Fig. 2B) triangular, mandibular seta and dentate blade present. Dorsal sulculs and posterior median tubercle absent. Maxilliped (Fig. 2E) five-segmented and tapering toward the tip; segment 1 big and rectangular; segment 2 twice wider than long, with four setae; segment 3 square, with seven setae; segment 4 with seven setae; terminal segment three longer and two shorter setae around the margin. Pylopod (Fig. 2F) two-segmented; segment 1 big and round, with five setae on basal margin and three setae on distal margin; segment 2 small and round.

Pereopod 1 (Fig. 2G): basis rectangular, with a long seta at inner distal area and eight setae on inner margin; ischium 0.7 times as long as basis, with sinuate inner margin and two long setae on sternal margin; merus 0.6 times as long as ischium, with a seta on inner distal area and two long setae on outer distal area; carpus almost as long as merus, with three longer setae, several shorter setae and two small tubercles on inner margin and a seta on outer distal areas; propodus rectangular, with 12 short setae on inner margin and a seta on outer margin; dactylus 2/3 as long as propodus.

Pereopod 2 (Fig. 2H): basis 3.0 times as long as wide, with a long seta at inner distal angle and two setae on inner margin and five setae on outer margin; ischium 5/8 as long as basis, with a long seta on both margins; merus 3/5 as long as ischium, with six setae on inner margin; carpus as long as merus, with three to four setae on inner margin; propodus as long as ischium, with seven to eight setae on inner margin and a seta at outer distal area; dactylus half the length of propodus.

Pereopod 3 (Fig. 2I): basis 3.0 times as long as wide, with a seta at inner distal angle and five long setae on inner margin; ischium a little shorter than basis, with two long setae on outer margin;

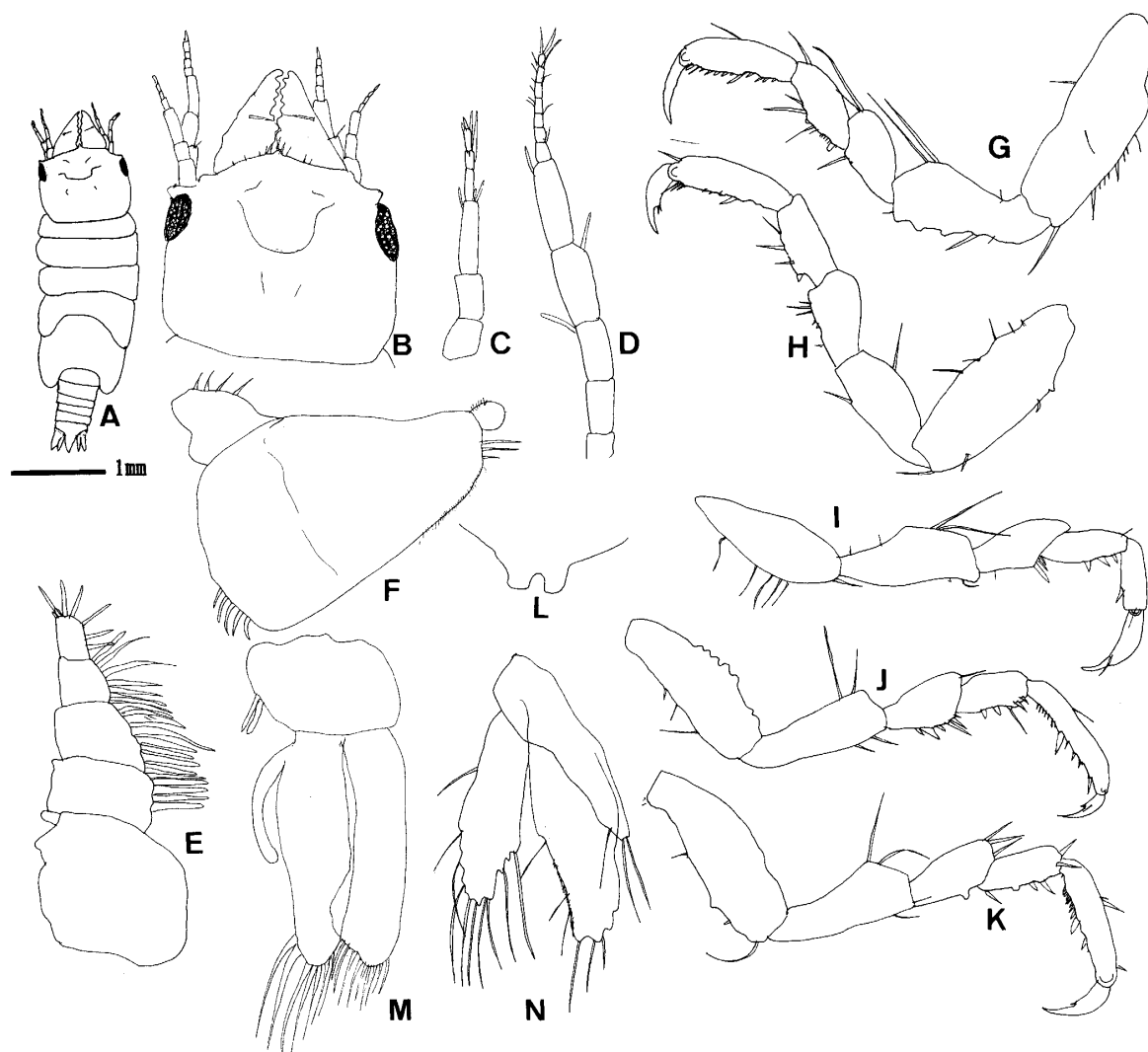


Fig. 2. *Gnathia nipponensis* Monod, 1926 (male). A, dorsal view; B, dorsal view of cephalon; C, antennule; D, antenna; E, maxilliped; F, pylopod; G–K, pereopods 1–5; L, penes; M, pleopod 2; N, uropod.

merus on three setae on inner margin; carpus as long as merus, with three stout setae on inner margin; propodus a little shorter than carpus, with a seta on inner margin; dactylus as long as propodus.

Pereopod 4 (Fig. 2J): basis with three setae on inner margin and six to seven tubercles on outer margin; ischium $4/5$ as long as basis, with two setae on inner margin and two long setae on outer margin; merus $3/5$ as long as ischium, with six setae on inner margin and a seta at outer distal area; carpus with a long and four stout setae on inner margin; propodus twice longer than carpus, with a series of seven setae on basal half of inner margin, a bigger setae on medial area and four setae on distal half of inner margin; dactylus $1/3$ of propodus.

Pereopod 5 (Fig. 2K): basis with a long seta at inner distal angle and two setae on inner margin; ischium a little shorter than basis, with two long setae on sternal margin; merus $2/3$ as long as ischium, with a tubercle on inner margin and three setae on outer distal area; carpus a little shorter than merus, with a tubercle and two setae on inner margin and two-setae on outer distal area;

propodus as long as ischium, with more than 12 setae on basal half of inner margin; dactylus less than half the length of propodus.

Penes (Fig. 2L) paired and short.

Pleopod 2 (Fig. 2M): endopod lanceolate with seven setae on distal margin; both rami equal in length, with eight to nine setae on distal margin stylus curved and half the length on endopod.

Uropod (Fig. 2N): basis elongated; endopod with sinuate margin and more than six setae; exopod with 10 setae and sinuate margin.

Remarks: The present specimens studied here are slightly different from the original description of *Gnathia nipponensis* reported from the sea of 110 m in depth Genkai-nada (Monod, 1926) in the following features: (1) shorter penes, (2) less numerous setae on fifth peduncular segment of antennae and (3) less numerous setae on second pleopod.

Suborder Asellota

Family Janiropsidae

Jaeropsis robata Richardson, 1899 [Jn.: Hirata-umimizumushi]

Material examined: 1 ♂, 2 ♀, Taushi, 19 June, 2000, coll. Katsuhiko Tanaka; 1 ♂, 3 ♀, Yumigahama, Minami-izu, 4 June, 2001, coll. Katsuhiko Tanaka.

Family Janiropsidae

Janiropsis sp.

Material examined: 1 ♀, from a colony of calcareous algae, Nabeta Oura, 9 May, 1993, coll. Masakazu Aoki.

Suborder Anthuridea

Family Anthuridae

Ananthura rigida Nunomura, 1976 [Jn.: Kata-uminanafushi]

Material examined: 1 ♀, off Hatsuhima, 35°0.2'N, 139°12'E–35°1.1'N, 139°12'E. 150–135 m in depth. 23 Oct. 2003.

Amakusanthura aokii Nunomura, 2004 [Jn.: Aoki-higenaga uminanafushi]

Materials examined: 2 ♂, 6 ♀, off Kisamsi, Shimoda-shi, 5 m in depth, 27 Aug. 1996. coll. Masakazu Aoki; 1 ♀, off Kisami, Shimoda-shi, 8 May, 1994 coll. Katsuhiko Tanaka; 1 ♂, off Shimoda, 7 May, 1997, coll. Katsuhiko Tanaka.

Cyathura sagamiensis n. sp. [New Jn.: Sagami-suna-uminanafushi]

(Fig. 3)

Material examined: 1 ♂ (holotype 16.3 mm in body length), off Miura-shi, off Manazuru, 35°07.45'N, 139°34.3'E–35°07.86'N, 139°34.37'E. 93.3–94.7 m in depth 20 June, 2002. R/V *Rinkai-maru*. Holotype (NSMT-Cr S26).

Description of male: Body more than 12 times as long as wide. Color white in alcohol. Eyes lacking. Pleon fused, without any suture lines. Pleon as long as 7th pereonal somite. Cephalon wider than long, about 4/9 as long as the pereonite 1, with a pair of slightly protruded anterolateral and a rounded medial projection on anterior margin. Relative length of 7 pereonal somites is 9 : 9 : 8 : 9 : 9 : 5 : 4. Pereonal somites without dorsal pits. All the pleonal somites fused and as long as the pereonite 7. Pleotelson rather slender, with a pair of big statocysts.

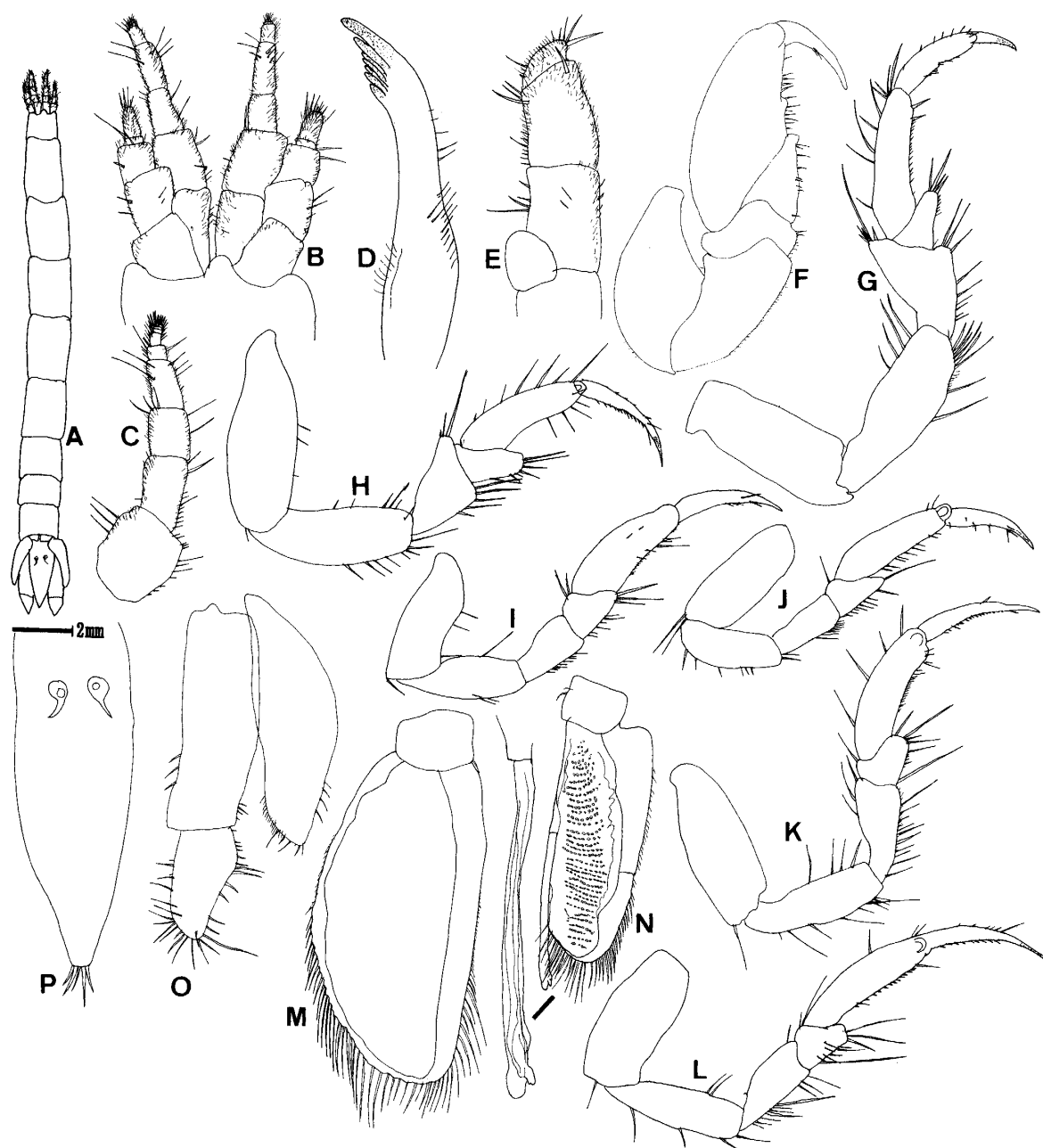


Fig. 3. *Cyathura sagamiensis* n. sp. (male, holotype). A, dorsal view; B, anterior margin of cephalon and both antennae; C, antenna; D, maxillula; E, maxilliped; F-L, pereopods 1-7; M, pleopod 1; N, pleopod 2; O, uropod; P, telson.

Antennule (Fig. 1B) with five segments bearing much hair. Antenna (Fig. 3C) with nine segments bearing much hair.

Mandible: pars incisiva with three teeth; lacinia mobilis with three teeth; palp of mandible of three segments; cutting fringe with 10 teeth. Maxillula (Fig. 3D) with seven saw-like teeth on apical area. Maxilliped (Fig. 3E) with four segments, terminal segment semicircular with five to six setae and many setae.

Pereopod 1 (Fig. 3F) subchelate: basis broadening toward the distal margin; ischium a little shorter than basis, with much hair on inner margin; merus short and rectangular, with two setae and several shorter ones; carpus triangular, pointed disto-lateral edge, with nine to ten setae on inner margin; propodus relatively stout, 2.4 times as long as wide, with a low protuberance on near the middle area on inner margin and 12–13 setae on inner margin; dactylus a little shorter than inner margin of propodus.

Pereopods 2–7 slender and for walking. Pereopod 2 (Fig. 3G): basis rectangular; ischium, as long as basis, with eight long setae on inner margin and four setae on outer margin; merus pentagonal, with nine to ten setae on inner margin and several setae on outer distal area; carpus small and triangular, with four setae on inner distal area; propodus 85 % as long as ischium, with much fine hair on inner margin and nine to ten relatively long setae on outer margin; propodus 55 % as long as carpus, with several short setae on inner margin and nine to ten short setae on outer margin; dactylus half the length of propodus.

Pereopod 3 (Fig. 3H): basis with a seta at inner distal margin and three setae on outer margin; ischium $4/5$ as long as basis, with eight longer setae on inner margin and six short setae on outer margin; merus triangular, with five setae on inner margin and three setae on outer distal margin; carpus small and triangular, with seven setae on inner margin; propodus $5/7$ as long as ischium, with four setae on inner margin and six setae on outer margin; dactylus as long as the inner margin of propodus, with many setae on inner margin and five to six short setae on outer margin.

Pereopod 4 (Fig. 3I): basis three times as long as wide, with a seta at inner distal angle and three setae on outer margin; ischium a little shorter than basis, with three setae on inner area and a seta on outer margin; merus $3/5$ as long as ischium, with four setae on inner margin and three setae on outer margin; carpus pentagonal, with seven setae on inner margin; propodus a little shorter than ischium, with four setae on inner margin; dactylus as long as the inner margin of propodus, with five to six short setae on inner margin.

Pereopod 5 (Fig. 3J): basis 2.5 times as long as wide, with two long setae at inner basal angle; ischium $4/5$ as long as basis, with six setae on inner margin and two setae on inner distal area; merus rectangular, $2/3$ as long as ischium, with eight setae in inner margin; carpus pentagonal, with a long seta at inner distal area, a seta on outer margin and many setae on inner margin; propodus 1.2 times longer than ischium, with more than nine setae on inner margin; dactylus a little shorter than propodus.

Pereopod 6 (Fig. 3K): basis 2.6 times as long as wide, with a long seta at inner basal angle; ischium $4/5$ as long as basis, with eight to nine setae on inner margin and four setae on outer margin; merus rectangular, $2/3$ as long as ischium, with 10 long setae and several short setae on inner margin, and three setae on outer margin; carpus pentagonal, with nine setae on inner margin, and a seta on outer margin; propodus as long as ischium, with many setae on inner margin and four setae on outer margin; dactylus a little shorter than propodus, with many short setae on inner margin.

Pereopod 7 (Fig. 3L): basis 2.4 times as long as wide, with a seta at inner basal angle; ischium 85% as long as basis, with four setae on inner margin and two setae on outer margin; merus $2/3$ as long as ischium, with 10–12 setae on inner margin; carpus pentagonal, with 10–12 long setae on inner margin and two setae on outer distal area; propodus 1.2 times longer than ischium, with many setae on inner margin and one to two setae on outer margin; dactylus a little shorter than propodus, with 10 short setae on inner margin and six to seven setae on outer distal margin.

Pleopod 1 (Fig. 3M): basis rectangular; endopod lanceolate, with more than 55 setae around the margin; exopod rectangular and a little smaller than endopod.

Pleopod 2 (Fig. 3N): endopod slender and as long as exopod; stylus straight with a small branch on outer margin.

Uropod (Fig. 3O): basis rectangular; endopod oval, with many long setae; exopod oval and somewhat longer than basis.

Etymology: Sagami is the name of the Bay where the specimen was collected.

Remarks: As far as I am aware, twenty-eight species of the genus *Cyathura* have been known as valid and the present new species is most closely allied to *Cyathura kikuchii* Nunomura, 1977 reported from Kumamoto, western Japan, but the former is separated from the latter in the following features: (1) shape of stylus, on male second pleopod, especially, absence of hand-shaped structure, (2) slenderer propodus of pereopod 1, (3) less numerous setae on antennae, (4) less numerous setae on pereopods, and (5) narrower pleotelson.

***Mesanthura cinctula* n. sp. [Jn.: Futairo-uminanafushi]**

(Fig. 4)

Material examined: 2 ♀ (1 ♀, holotype 14.0 mm in body length and 1 ♀, paratype 10.1 mm in body length), off Manzuru 35°1.2'N, 139°12.35'E–35°3.1'N, 139°12'E, 269–247 m in depth, 23 Oct. 2002. Type series is as follows: Holotype (NSMT-Cr S27), and a paratype (NSMT-Cr S28).

Description: Body elongated, 15.0 times as long as wide. Color white, with square dark areas on dorsal surface. Cephalon slightly longer than wide, with a low medial projection and lateral lobes on anterior margin. Eyes relatively big, each eye with about 30 ommatidia. Mutual length of cephalon and pereonal somites 1–6 subequal in length, pereonal somite 7 a little shorter than the pereonal somite 6. Pleonal somites fused dorsally, only lateral suture line recognizable. Telson (Fig. 4V) lanceolate, with a pair of relatively small statocysts.

Antennule (Fig. 4C) five-segmented. Antenna (Fig. 4D) seven-segmented; distal two segments bears much hair.

Mandible (Fig. 4E): palpal segment 3 with eight spines. Maxillula (Fig. 4F) slender, with ten setae at the tip. Maxilliped (Fig. 4G): palpal segments 1–2 fused and rectangular and wider than long; palpal segment 3 twice longer than the segments 2; palpal segments 4–5 fused and semicircular, with seven setae; epipodite rounded.

Pereopod 1 (Fig. 4H) subchelate: basis stout; ischium triangular; merus rectangular, twice wider than long, with two setae on inner margin; carpus triangular, with sinuate margin and seven setae on inner margin; propodus stout, with many teeth and sinuate on inner margin and strong claw bearing four setae on lateral distal area four setae on inner margin of surface at base of unguis.

Pereopod 2 (Fig. 4I): basis rectangular, with a seta at inner distal area; ischium as long as basis, with three teeth on inner margin; merus half the length of ischium, with a long seta and much hair on inner margin; carpus triangular, with a long seta and much hair on inner margin; propodus subchelate, with much hair on the basal half, six to seven setae on distal half of inner margin, palm with many teeth; dactylus half the length of propodus.

Pereopod 3 (Fig. 4J): basis rectangular; ischium a little longer than basis; merus half the length of basis; carpus triangular, with three to four setae and much hair on inner margin; propodus stout and subchelate, palm with four setae and much hair on inner margin; dactylus with three setae at base

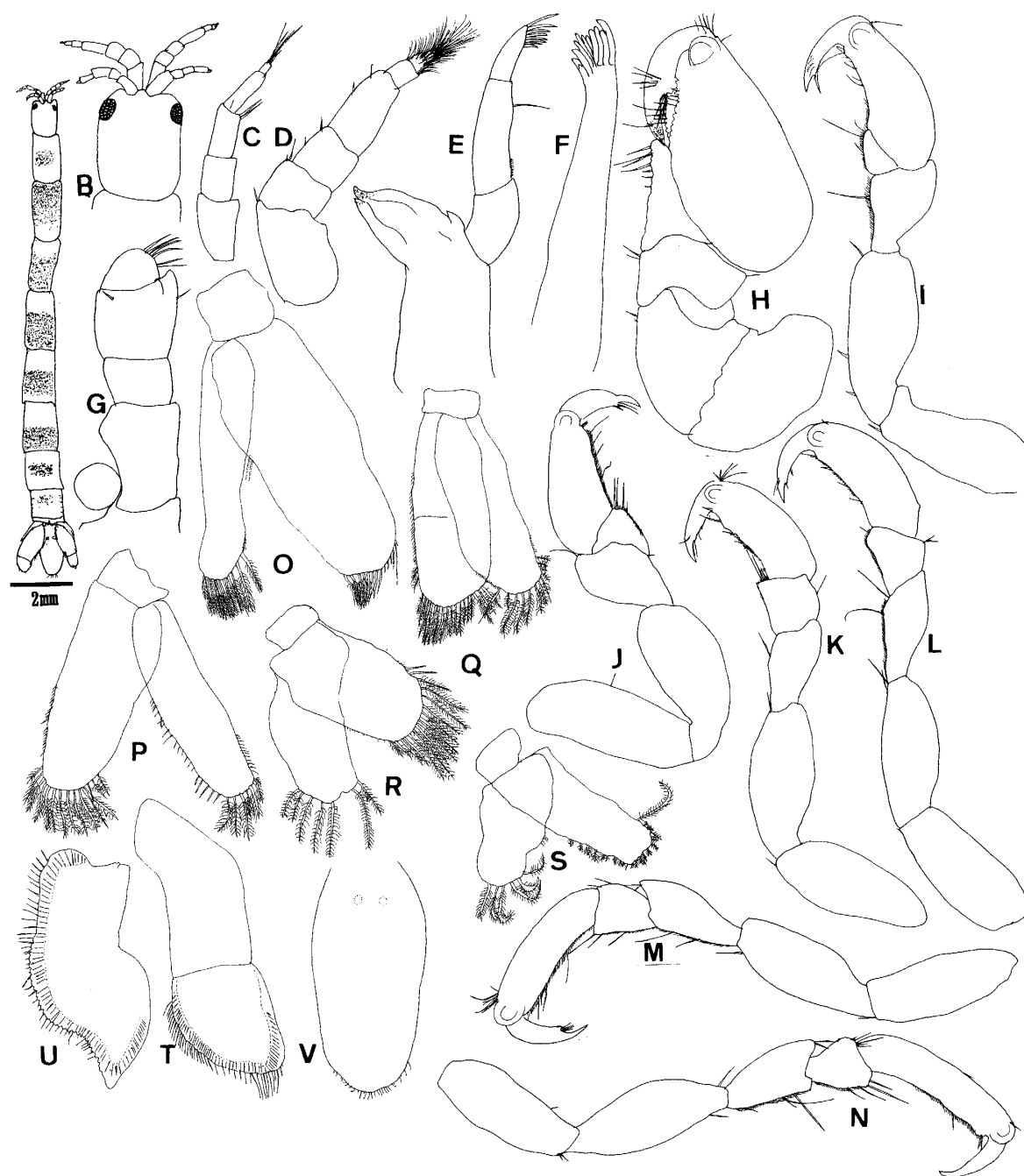


Fig. 4. *Mesanthura cinctula* n. sp. (female, holotype). A, dorsal view; B, cephalon; C, antennule; D, antenna; E, mandible; F, maxillula; G, maxilliped; H–N, pereopods 1–7; O–S, pleopods 1–5; T, endopod of uropod; U, exopod of uropod; V, telson.

of unguis.

Pereopod 4 (Fig. 4K): basis rectangular, with a seta at inner distal angle; ischium rectangular, a little longer than basis; merus half the length of ischium, with a seta hair on inner margin; carpus square, $\frac{3}{4}$ as long as merus, with three setae on inner distal area and a seta on outer margin; propodus twice longer than merus, with three to four setae and much hair on inner margin; dactylus

with three setae at the base of claw.

Pereopod 5 (Fig. 4L): basis rectangular; ischium rectangular, with two setae at inner distal angle, with five setae at outer distal area; merus $5/7$ as long as ischium, with a seta and much hair on inner margin; carpus $3/5$ as long as merus, with much hair on inner margin; propodus twice longer than merus, with more than three to four setae and much hair on inner margin; dactylus with three setae on inner margin and a seta at the base of claw.

Pereopod 6 (Fig. 4M): basis rectangular; ischium rectangular, with a seta on inner distal angle; merus $5/8$ as long as ischium, with two setae and much hair on inner margin, and two setae on outer distal angle; carpus half the length of merus, with three setae and much hair on inner margin; propodus with three setae and much hair on inner margin and six to seven setae on outer distal area; dactylus with two setae on inner margin and a few of setae at the base of claw.

Pereopod 7 (Fig. 4N): basis rectangular, with two short setae on inner distal angle; ischium rectangular, with a seta on both margins; merus $5/8$ as long as ischium, with three setae and much hair on inner margin and two setae on outer distal angle; carpus $3/5$ as long as merus, with four setae on inner margin and five to six setae at outer distal angle; propodus 2.5 times longer than carpus, with three setae and much hair on inner margin; dactylus less than half the length of propodus.

Pleopod 1 (Fig. 4O): basis square; both rami rectangular, with 13–15 plumose setae around the margin.

Pleopod 2 (Fig. 4P): basis rectangular; endopod rectangular, with 14–15 plumose setae; exopod with five to six longer plumose setae and more than 25 shorter setae.

Pleopod 3 (Fig. 4Q): endopod, with about 20 plumose setae; exopod rectangular, with about 10 plumose setae.

Pleopod 4 (Fig. 4R): endopod rectangular, with 13–15 plumose setae; exopod rectangular, with seven plumose setae.

Pleopod 5 (Fig. 4S): endopod rectangular, with 17 plumose setae including a long one; exopod rectangular, with a shallow concave sinuosity, with six plumose setae.

Uropod (Fig. 4T and U): endopod only a little surpassing telson, terminal segment with about 50 setae; exopod oval, with distal concave sinuosity and bears more than 40 setae.

Etymology: “cinctulus” means girdle-shaped in Latin. The present new species has girdle-shaped darker color patterns in dorsal view.

Remarks: Forty-four species of the genus *Mesanthura* have been recorded as valid. Among them, the present new species is most closely allied to *Mesanthura atrata* Nunomura, 1985 reported from Toyama Bay, the sea of Japan. But the former is separated from the latter in the following features: (1) presence of paler parts on pereonal somites, (2) numerous setae on pleopod and (3) numerous setae on palpal segments of maxilliped.

Family Paranthuridae

Paranthura japonica Richardson, 1909

Materials examined: 1 ♀ (ovigerous with 10 eggs), off Kisami, Shimoda-shi, 5 m in depth, 27 Aug. 1996. coll. Masakazu Aoki; 2 ♀, off Kisami, 8 Aug. 1999, coll. Katsuhiko Tanaka.

Paranthura sp. 1

(Fig. 5)

Material examined: 1 ♀ (9.8 mm in body length), off Shimoda, 20 m in depth, Nov. 1954. The

present specimen is deposited at the Showa Memorial Institute (NSMT).

Description: Body 12.6 times as long as wide. Color white, without chromatophores. Cephalon (Fig. 5 B) 1.5 times longer than wide. Eyes mediocre in size; each eye composed of 23–24 ommatidia and each ommatidium not connected. Relative length of Pereonites: $C < 1 < 2 > 3 < 4 = 5 > 6 > 7$. Dorsal pits lacking. Pleon somewhat longer than pereonite 7. All the pleonal somites fused dorsally. Telson (Fig. 5T) narrow-lanceolate with 11–12 setae at the tip.

Antennule (Fig. 5E) with eight segments. Antenna (Fig. 5F) shorter but wider than antennule, with seven segments. Mandible (Fig. 5G): pars incisiva acute; palp three-segmented, palpal segment 2 with a seta near the distal area terminal segment with nine setae. Maxillula (Fig. 5H) with eight to nine saw-like setae. Maxilliped (Fig. 5I) slender and two-segmented.

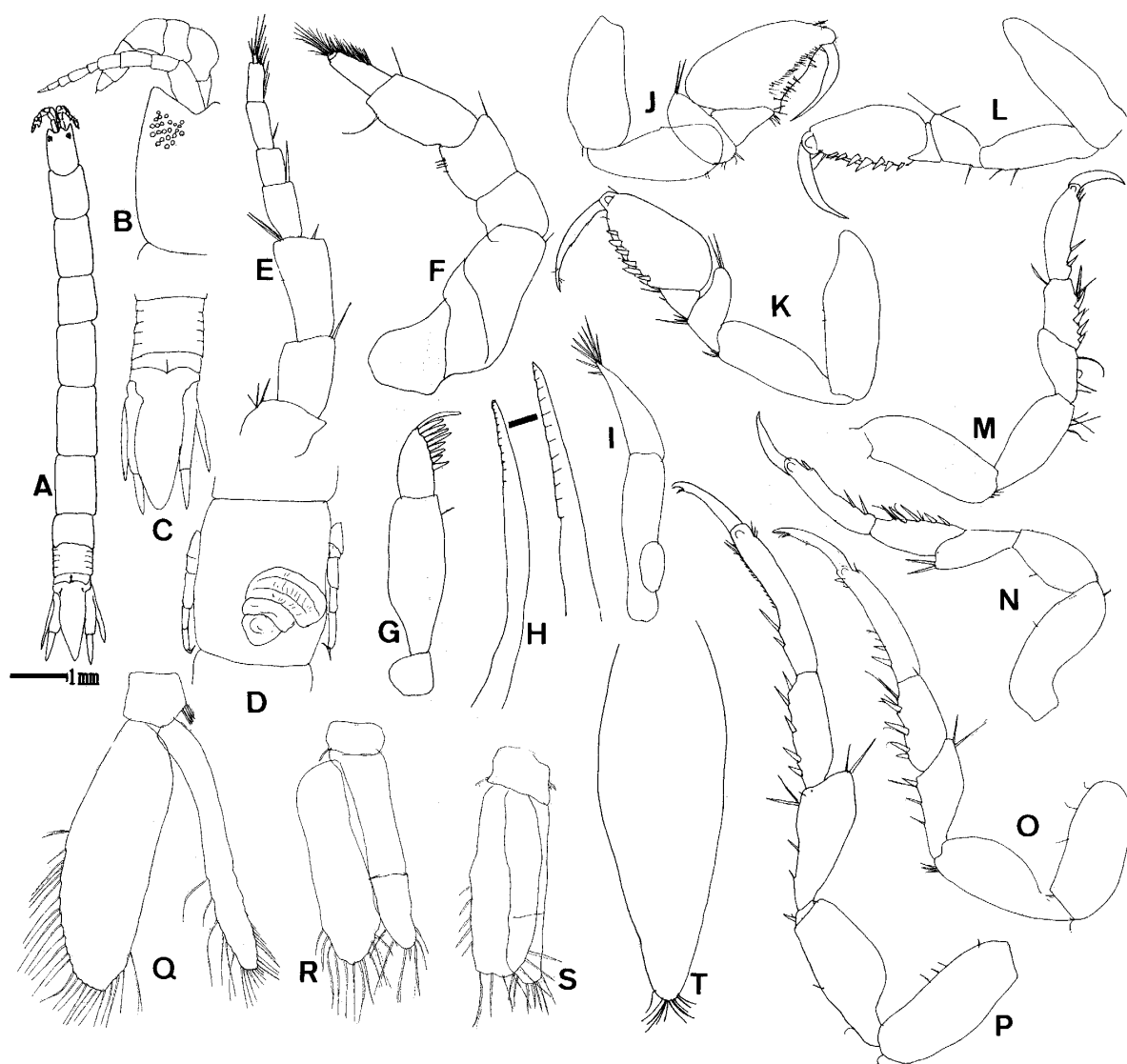


Fig. 5. *Paranthura* sp. (female from Shimoda). A, dorsal view; B, left half of cephalon; C, pleon and pleotelson; D, attached shell on the ventral side of pereonite 4; E, antennule; F, antenna; G, palp of mandible; H, maxillula; I, maxilliped; J–P, pereopods 1–7; Q, pleopod 1; R, pleopod 2; S, pleopod 5; T, Uropod.

Pereopod 1 (Fig. 5J) subchelate: basis rectangular, with a seta at inner distal area; ischium as long as basis; merus short and rectangular, with four setae on inner margin and two setae on outer margin; carpus small and triangular; propodus stout, with 13 stout setae on inner margin and more than 30 short setae along the inner margin; dactylus long, $2/3$ as long as propodus.

Pereopod 2 (Fig. 5K) subchelate: basis rectangular; ischium a little shorter than basis, with two setae at inner distal margin; merus triangular, with two setae on outer margin; carpus small and triangular; propodus stout, with six stout setae on inner margin; dactylus long, $5/6$ as long as propodus.

Pereopod 3 (Fig. 5L) subchelate: basis rectangular; ischium $2/3$ as long as basis, with two setae on distal half of inner margin; merus trapezoidal, with a seta on inner margin and two setae on outer margin; carpus small and triangular; propodus long and oval, with seven stout setae and a few of simple setae on inner margin; dactylus $4/5$ as long as propodus.

Pereopods 4–7 not subchelate. Pereopod 4 (Fig. 5M): basis rectangular, with three short setae on inner distal area; ischium $5/6$ as long as basis, with four setae on distal half of inner margin; merus trapezoidal, with four setae on inner margin; carpus rectangular, with four stout setae and two setae on inner margin and a seta at outer distal area; propodus 1.5 times longer than carpus, with two setae on basal half of inner margin; dactylus half the length of propodus.

Pereopod 5 (Fig. 5N): basis rectangular, with a seta on inner margin; ischium $3/4$ as long as basis; merus trapezoidal, with two setae on outer distal margin; carpus rectangular, with four to five stout setae, and a few setae on inner margin; propodus a little longer than carpus, with two setae on basal half of inner margin, and a seta on inner distal area; dactylus half the length of propodus.

Pereopod 6 (Fig. 5O): basis rectangular, about twice as long as wide, with a seta at inner distal area and three setae at outer distal area; ischium as long as basis, with three setae on inner distal area; merus triangular, with four setae on inner margin and two setae on outer margin; carpus rectangular, with four stouter setae and several setae on inner margin and several setae on inner margin; propodus with two stout setae and a few of setae on basal half of inner margin; dactylus a little; shorter than propodus.

Pereopod 7 (Fig. 5P): basis rectangular, with a seta at inner distal area and four setae on outer margin; ischium as long as basis; merus with two setae at inner distal margin and two setae at outer distal margin; carpus with five stouter setae on inner margin; propodus 1.5 times longer than carpus, with two setae on basal half and many short setae on distal half of inner margin; dactylus about half the length of propodus.

Pleopod 1 (Fig. 5Q): basis rectangular, with five setae on lateral margin; endopod narrow lanceolate, with about 25 setae around the margin; exopod lanceolate, with 32–33 setae around the margin.

Pleopod 2–5 (Figs. 5R–S) rectangular; both rami lanceolate, with several seta around the margin.

Uropod: basis long; endopod rather stout and tapering toward the tip; exopod a little longer than basis.

Remarks: The present specimen closely agrees with the description of *Paranthura japonica* (Richardson, 1906) recorded from many areas of Japanese waters, but the former is separated from the latter in the following features: (1) separated each ommatidium of eyes, (2) slenderer pleotelson, (3) less numerous setae on mandibular palp, (4) numerous flagella of antennule, (5) longer pereopods 4–7 and (6) less numerous saw-like setae on maxillula. The present specimen is allied to *Paranthura*

sp. reported from Miyake Island (Nunomura, 1999) in having separated ommatidia of eyes but is different from the latter in the following features: (1) more strongly elongated body, (2) narrower pleotelson, (3) longer antennae, (4) less numerous saw-like setae on maxilliped, (5) numerous setae on mandibular and (6) palp, numerous ommatidia of eyes. As only one specimen was available to me, I refrained to establish a new species.

***Paranthura* sp. 2 (aff. *lineata* Nunomura, 1997)**

Materials examined: 1 ♀, off Nabeta, Shimoda-shi, 29 Apr. 1998, coll. Noboru Nunomura.

Suborder Valvifera

Family Arcturidae

***Arcturus hastatus* n. sp. [New Jn.: Yario-oninanafushi]**

(Fig. 6)

Material examined: 2 ♂ (1 ♂ holotype, 8.4 mm in body length and 1 ♂ paratype, 9.5 mm in body length) and 2 ♀ (1 ♀ allotype, 7.6 mm in body length and 1 ♀, 8.3 mm in body length), off Mirura, Miura Peninsula., 34°52'N, 139°38'E–34°51'N, 139°39'E, 487–474 m in depth, 25 Oct. 2002. Type series is as follows: Holotype, (NSMT-Cr S29), allotype (NSMT-Cr S30) a paratype (NSMT-Cr S30), and a paratype (TOYA Cr-13135).

Description of male: Body elongated. 11.0 times as long as wide, excluding both antennae and all the spines. Color dull yellow in alcohol. Cephalon (Fig. 6C) with a pair of strong projections at outer distal angles. Eyes mediocre in size, each eye composed of about 12 ommatidia. Pereonal somites subequal in length except segment 4; segment 4 three times longer than the others. Dorsal surface of pereonal somites 4 and 5 with a pair of spines. Pereonal somite 4 with a lateral protrusion at lateral posterior areas. Pleotelson long, with a pair of lateral projections at basal areas.

Antennule (Fig. 6D) rather short and four-segmented, extending a little beyond the distal margin of fourth peduncular of antenna; terminal segment with 11–12 aesthetascs on lateral margin. Antenna (Fig. 6E) long, occupies more than 55 % of body length; peduncle 5-segmented and 5th segment as long as the total length of pereonal gonites 1–5; flagellum short and five-segmented. Left mandible (Fig. 6E): pars incisiva three-toothed; lacinia mobilis two-toothed; processus molaris big. Maxillula (Fig. 6G): outer lobe with ten setae at the tip. Maxilla (Fig. 6H): endopod 14 to 16 setae, each ramus of outer lobe with two setae. Maxilliped (Fig. 6I): endite rectangular, with three coupling hooks on lateral margin and 15–16 teeth on distal margin; palp five-segments segments 3 longest, with eight long setae on inner margin; segment 4 a little shorter than the segment 3, with 11 setae on inner margin and four setae on outer margin; terminal palpal segments rectangular, with six to seven long setae; epipodite slender.

Pereopod 1 (Fig. 6J): basis, 2.7 times as long as wide with there long setae on inner margin; ischium 1.4 times longer than basis, with nine to ten setae on inner margin; merus 4/5 as long as ischium, with more than 13 long setae on inner margin; carpus as long as merus, with 23–25 setae including three saw-like bigger setae on inner margin; propodus short; dactylus with a claw, bearing a serrate spine.

Pereopods 2–4 long and slender, with many long setae. Pereopod 2 (Fig. 6K): basis three times as long as wide, with two setae on inner margin; ischium, 0.4 times as long as basis, with three setae on inner margin; merus long, 2.9 times longer than ischium, with seven long setae and a few of short

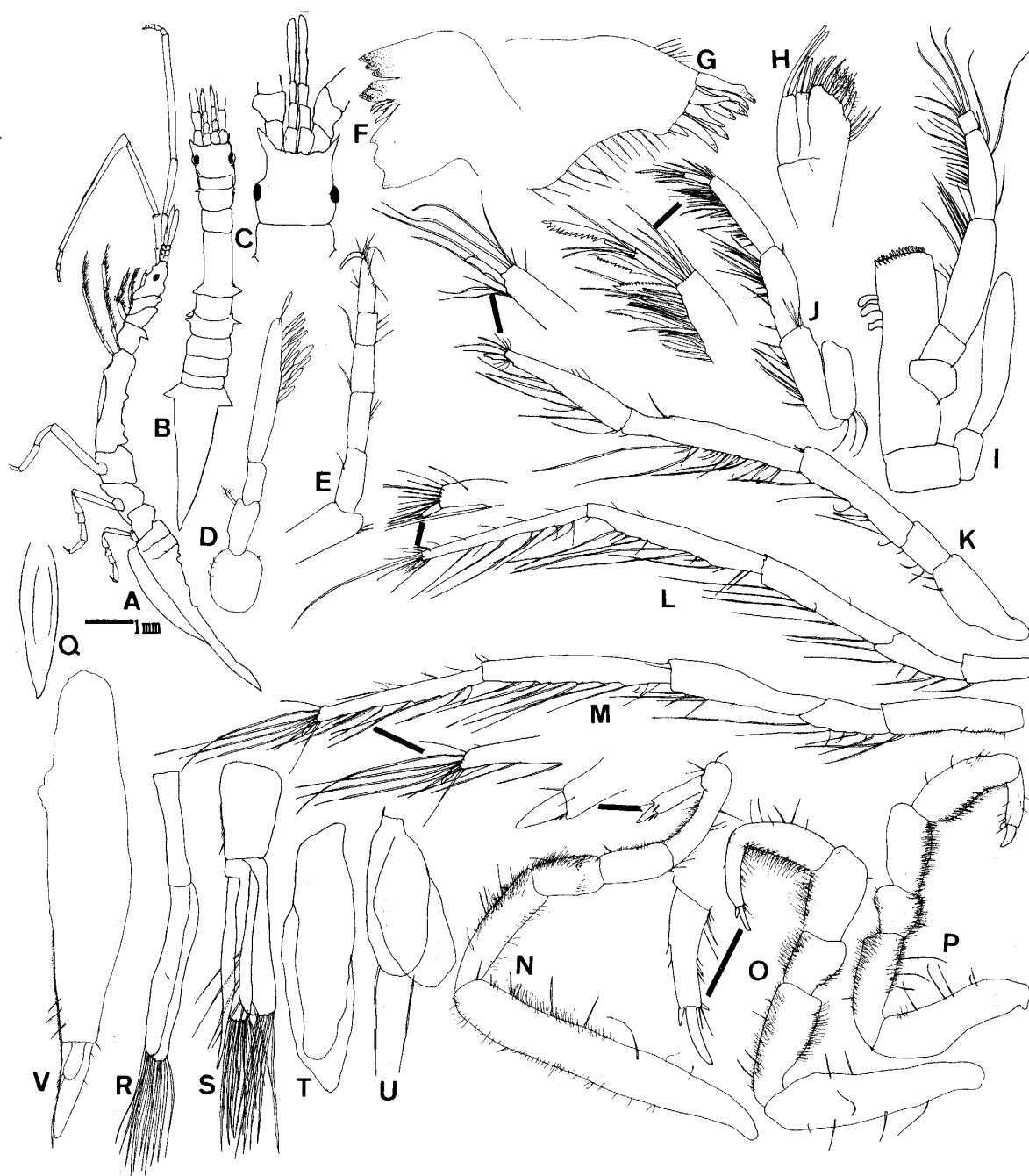


Fig. 6. *Arcturus hastatus* n. sp. (male, holotype). A, lateral view; B, dorsal view; C, cephalon; D, antennule; E, antenna; F, left mandible; G, outer lobe of maxillula; H, maxilla; I, maxilliped; J-P, pereopods 1-7; Q, penes; R-U, pleopods 1-4; V, uropod.

setae on inner margin; carpus 1.4 times longer than merus, with more than 20 setae including two very long setae on inner margin; propodus 0.8 times longer than carpus, with eight setae on inner margin; dactylus small.

Pereopod 3 (Fig. 6L) a little longer than pereopod 2; basis rather short, with a seta on inner margin; ischium a little longer than basis, with five to six setae on inner margin; merus 1.7 times

longer than ischium, with six long setae on inner margin; carpus 1.2 times longer than merus, with 13–15 setae including four long ones on inner margin; propodus as long as carpus, with nine to ten setae including four long ones on inner margin and a very long seta on distal margin; dactylus small and rectangular.

Pereopod 4 (Fig. 6M) a little longer than pereopod 2: basis rectangular, with many short setae on inner margin and two long setae at inner distal area; ischium 55 % as long as basis, with five setae on inner margin; merus 1.8 times longer than ischium, with four long setae on distal half of inner margin; carpus a little longer than merus, with 12–13 setae on inner margin; propodus as long as merus, with eight to nine long setae on inner margin; dactylus small and forms a claw.

Pereopods 5–7 walking legs with much hair. Pereopod 5 (Fig. 6N): basis long, 7.0 times as long as wide, with 10–12 setae on outer margin and much hair on both margins; ischium $\frac{2}{5}$ as long as basis, with five setae and much hair on inner margin; merus $\frac{3}{5}$ as long as ischium, with much hair on inner side; carpus a little longer than merus, with much hair on inner side; propodus 2.5 times longer than carpus; dactylus as long as propodus and with a claw.

Pereopod 6 (Fig. 6O) a little shorter than the pereopod 5: basis about $\frac{2}{3}$ as long as that of the pereopod 5, with three long setae on inner margin and two setae on outer margin; ischium half the length of basis, with four setae and much hair on inner area and much hair on outer margin; merus $\frac{2}{5}$ as long as basis, with many setae on inner and outer sides; carpus 1.5 times longer than merus, with much hair on inner side; propodus a little longer than carpus, with much hair on inner margin and six setae on outer margin; dactylus rather long, $\frac{2}{3}$ as long as propodus, with eight setae on inner margin and two claws at the tip.

Pereopod 7 (Fig. 6P) similar to pereopod 6, but a little shorter than that: basis about $\frac{3}{4}$ as long as that of the pereopod 6, with six long setae on inner margin; ischium 0.7 times as long as basis, with three setae and much hair on inner area and much hair on outer margin; merus half the length of ischium, with many setae on inner and outer sides; carpus 1.6 times longer than merus, with much hair on inner side; propodus 1.5 times longer than carpus, with much hair on inner side and four to seven setae on outer margin; dactylus rather long, $\frac{2}{3}$ as long as propodus, with four setae on inner margin and two claws at the tip.

Penes (Fig. 6Q) fusiform.

Pleopod 1 (Fig. 6R): basis rectangular, with four to five setae on lateral margin; each ramus rectangular, with six to ten setae on distal area.

Pleopod 2 (Fig. 6S): basis rectangular, each ramus rectangular, with 11–13 setae; stylus extends beyond the posterior end of both rami and tapering toward the tip.

Pleopod 3 (Fig. 6T) narrow-lanceolate, without setae.

Pleopod 4 (Fig. 6U) lanceolate but shorter than pleopod 3, each ramus with a seta on distal area.

Uropod (Fig. 6V): basis long; endopod triangular; exopod small, with a long seta.

Female: Body shorter than male: body, especially of pereonal somite 4.

Etymology: “hastatus” means “armed with a spear” in Latin.

Remarks: The present species is allied to *Arcturus macrurus* Kussakin, 1982 reported from Okhotsk sea, but the following differences are recognized features: (1) presence of dorsal spines on fourth pereonal somite, (2) shorter fourth pereonal somite, (3) less numerous setae on pereopods 1–4, (4) longer claw and more setose pereopods 5–7, (5) presence of aesthetascs on lateral border of terminal segment of antennule and (6) presence remarkable protrusion at anterolateral margin of cephalon.

Neastacilla spinifera n. sp. [New Jn.: Toge-himenanafushi]

(Fig. 7)

Material examined: 1 ♀ (holotype, 7.7 mm in body length), off Okada, Oshima, 34°52'N, 139°38'E–34°51'N, 139°39'E, 487–474 m in depth, 25 Oct. 2002; 1 ♀ (paratype, 8.0 mm in body length), off Shimoda, 34°40'N, 139°19'E–34°40'N, 139°18'E, 307–289 m in depth, 24 Oct. 2002, T/V *Shin'yo-maru*. Type series are as follows, Holotype (NSMT-Cr S31) and a paratype (NSMT-Cr S32).

Description of female: Body elongated. 4.0 times as long as wide, excluding both antennae and

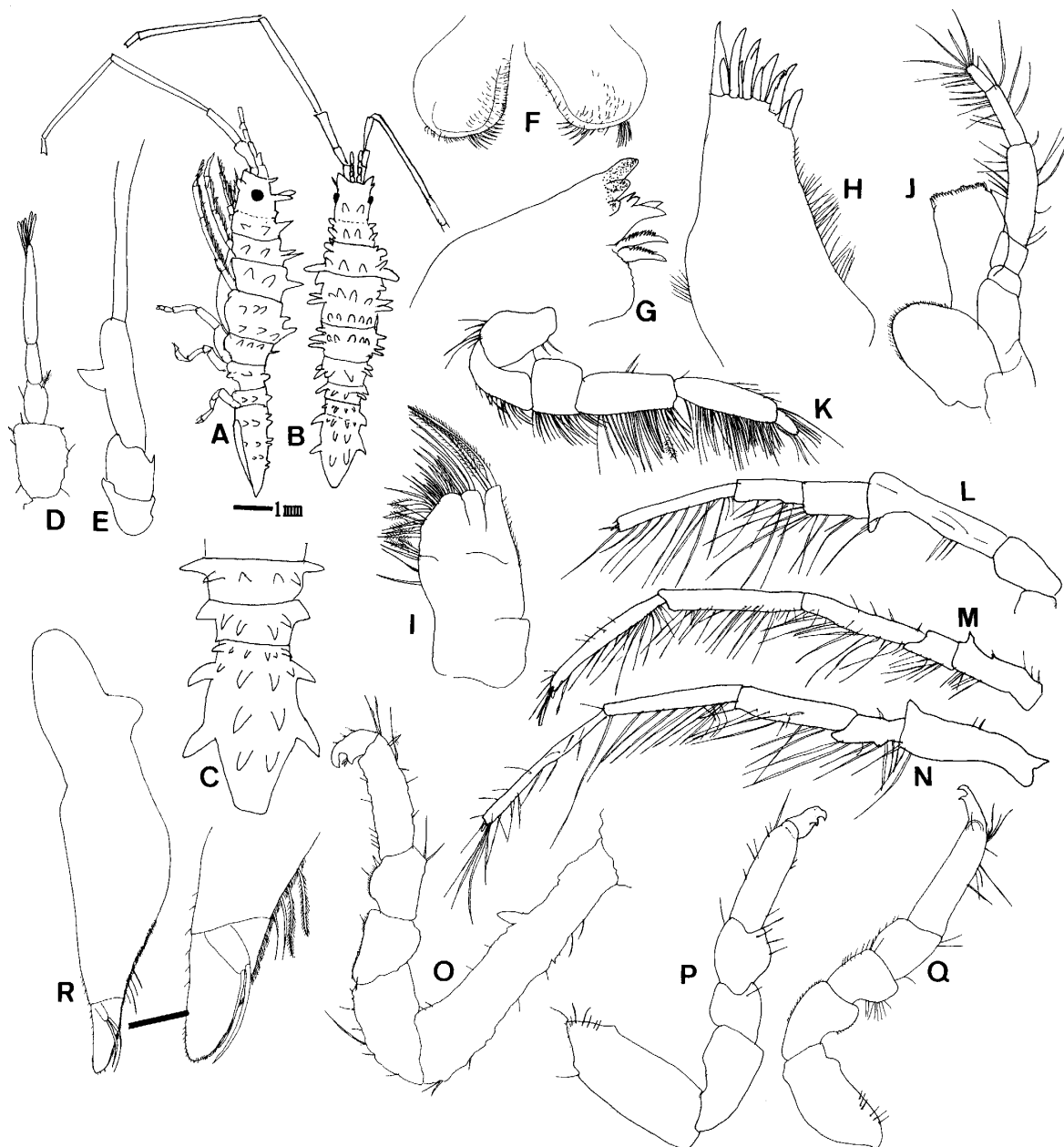


Fig. 7. *Neastacilla spinifera* n. sp. (female, holotype). A lateral view; B, dorsal view; C, posterior part of pereonal somites, pleonal somites and pleotelson; D, antennule; E, antenna; F, labrum; G, right mandible; H, outer lobe of maxillula; I, maxilla; J, maxilliped; K–Q, pereopods 1–7; R, uropod.

all the spines. Color dull yellow in alcohol. Cephalon with a medial area of the anterior margin and a pair of weak projections at outer distal angles. Eyes mediocre in size, each eye composed of about 80 ommatidia. Pereonal somite 4 is widest. Dorsal surface of each pereonal somites 1–2 with two pairs of spines on lateral margin and dorsal area. Pereonal somite 4 with a lateral protrusion at lateral posterior areas. Pereonal somites with a pair of lateral projection. Pleotelson (Fig. 7C) twice longer than wide, with 2 pairs of lateral projections.

Antennule (Fig. 7D) rather short, extends a little beyond the distal margin of second peduncular of antenna; segment 1 round, segment 2 rectangular, with a plumose seta; segment 3 rectangular; segment 4 long, with five aesthetascs on distal half of lateral margin. Antenna (Fig. 7E): basal area long; peduncular segment 3 with a strong spur; unfortunately the flagellum are all broken in all the specimens. Labrum (Fig. 7F) lanceolate.

Right mandible (Fig. 7G): pars incisiva three-toothed; lacinia mobilis four-toothed; two-serrated setae. Left mandible lost during dissection. Maxillula (Fig. 7H) with 11 teeth at the tip of outer lobe. Maxilla (Fig. 7I): endopod wide, with about 30 setae; both rami of exopod slender, each with two or three long setae. Maxilliped (Fig. 7J): endite rectangular, with 15–16 teeth on distal margin; palp five-segments segments 3 and 4 longer with many long setae, terminal palpal segments rectangular, with long setae; epipodite slender.

Pereopod 1 (Fig. 7K): basis oval, with six setae on inner margin and three setae on outer margin; ischium with 12 setae on inner margin; merus square, with 15–16 setae on inner margin; carpus 2.3 time longer than merus, with 24–25 long setae including a plumose seta on inner margin; propodus as long as carpus, with about 40 long setae on inner margin; dactylus lanceolate, less than 1/4 as long as propodus.

Pereopods 2–4 long and slender, with many long setae. Pereopod 2 (Fig. 7L): basis 1.6 times as long as wide, ischium 2.1 times longer than basis, with a protruded inner distal area bearing a long seta; merus less than half the length of ischium, with 10 long setae on inner and distal area; carpus as long as merus, with six setae on inner margin; propodus 1.9 times longer than carpus, with 11–12 setae on inner margin; dactyls small.

Pereopod 3 (Fig. 7M) a little longer than the pereopod 2: basis with seven setae on inner margin, two protuberances and four setae on outer margin; ischium, less than half the length of basis, with eight to nine setae on inner margin; merus 2.5 times longer than ischium, with 17–18 long setae on inner margin and five to six setae on outer margin; carpus a little longer than merus, with 15–16 longer and several shorter setae on inner margin; propodus as long as carpus, with 15–17 setae on inner margin, seven to eight setae on distal margin and four setae on outer margin; dactylus small.

Pereopod 4 (Fig. 7N) 1.2 times longer than pereopod 3: basis 3.2 time as long as wide, with a protruded area at outer distal area and two long setae at inner distal area; ischium rather short, less than half the length of basis, with four long setae on inner margin; merus 1.8 times longer than ischium, with seven to eight long setae on inner margin; carpus 1.2 times longer than merus, with nine to 14 setae on inner margin; propodus 1.2 times longer than carpus, with 11 setae on inner margin, five setae on outer margin and five to six setae on distal margin; dactylus small.

Pereopods 5–7 walking legs. Pereopod 5 (Fig. 7O): basis rectangular, with a strong projection on outer margin and several short setae on both margins; ischium, with five setae on inner margin; merus square, with much hair on inner margin; carpus as long as merus, with two setae and much hair on inner margin and two setae on outer distal area; propodus 1.5 time longer than merus, with

many setae on inner margin and seven to eight setae on outer margin; dactylus bifid.

Pereopod 6 (Fig. 7P): basis stout, twice as long as wide, with six setae on basal half of outer margin; ischium $3/4$ as long as basis; merus square, with a seta on inner margin; carpus square, with four setae on inner side and a seta on outer margin; propodus rectangular, with six setae on outer margin; dactylus bifid.

Pereopod 7 (Fig. 7Q) similar to pereopod 6, but a little shorter than that: basis with six setae on basal half of outer margin; ischium 0.7 times as long as basis, with much hair on inner margin and distal half of outer margin; merus square; carpus square, with several setae on inner side and three setae on outer margin; propodus rectangular, with five to six setae on outer margin and three setae at outer distal area; dactylus bifid.

All the pleopods lanceolate.

Uropod (Fig. 7R) basal terminal segment round; endopod lanceolate, with fine setae around the margin; exopod short and with two long setae. Pleopods missing.

Etymology: “spinifer” means “throne bearing” in Latin.

Remarks: The present new species is also allied to *Neastacilla exillis* Kussakin 1971, recorded from the Bering sea and other waters, but the former is separated from the latter in the following features: (1) numerous setae on dorsal surface, (2) absence of dactylus of pereopods 2–4, (3) fewer setae on pereopod 7, (4) presence of spines on antenna and pereopods, (5) smaller epipodite of uropod and (6) less numerous setae on exopod of uropod.

***Neastacilla scabra* n. sp.** [New Jn.: Tsubutsubu-himenanafushi]

(Fig.8)

Material examined: 3 ♀ (1 ♀, holotype, 10.4 mm in body length, 2 ♀, paratypes, 7.7–9.5 mm in body length), off Mabuse, Oshima, 34°40'N, 139°19'E–34°40'N, 139°18'E, 307–289 m in depth, (St.29) 24 Oct. 2002, dredged by T/V *Shin'yo-maru*. Type series is as follows: Holotype (NSMT-Cr S33), paratype (NSMT-Cr S34), and a paratype (TOYA Cr-13136).

Description: Body 4.6 times as long as wide excluding both antennae and all the spines. Color dull yellow in alcohol. Cephalon rectangular, slightly longer than wide, with small medial projection and a pair of antero-lateral projections. Eyes relatively big, each eye with about 150 ommatidia. Pereonal somites subequal in length. Pereonal somite 4 a little longer than any other pereonal segments. Dorsal surface with many small tubercles. Pleotelson (Fig. 8B) with a pair of protruded areas.

Antennule (Fig. 8C) rather short, extending to the middle area of third peduncular of antenna. Segment 1 big and 1 round; segment 2 rectangular, with a plumose setae; segment 3 rectangular; segment 4 long, with eight pairs of aesthetascs on distal half of lateral margin. Antenna (Fig. 8D): peduncular segments 1–2 short and square, segment 3 longer than the third, segment 4, 2.3 times longer than the third. Unfortunately the flagellum was broken.

Right mandible (Fig. 8E): pars incisiva two-headed; lacinia mobilis thin, with four teeth. Left mandible lost during dissection. Maxillula (Fig. 8F) rather wide, 10 teeth at the tip of outer lobe. Maxilla (Fig. 8G); endopod wide, with 20–21 teeth; both rami of exopod slender, each with three or four longer setae. Maxilliped (Fig. 8H): endite wide; palp five-segments, segments 3 longest, with many long setae, terminal palpal segments small; epipodite round.

Pereopod 1 (Fig. 8I): basis 4 times as long as wide, with two setae on inner distal area and about

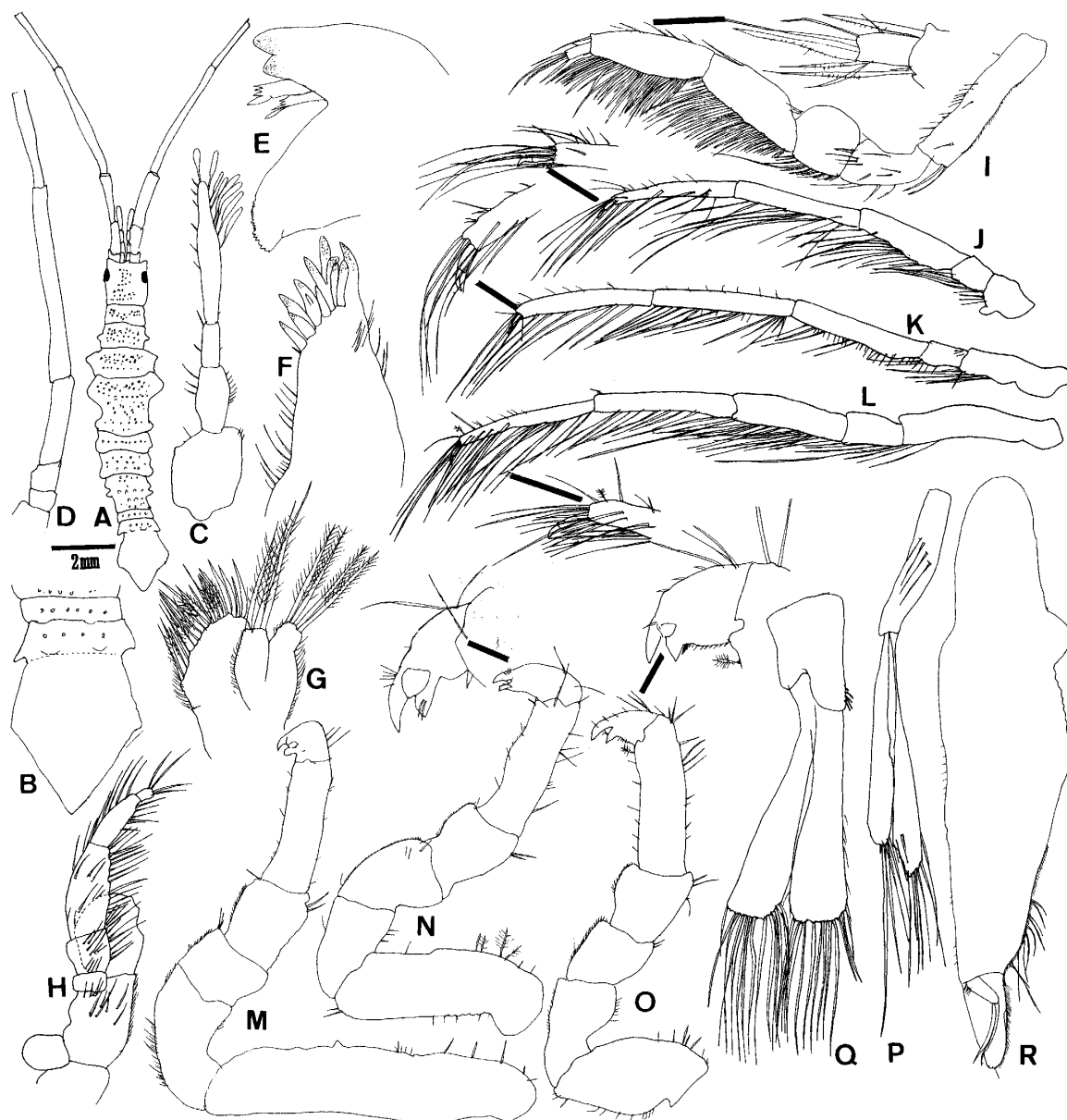


Fig. 8. *Neastacilla scabra* n. sp. (female, holotype). A, dorsal view; B, dorsal view of posterior part; C, antennule; D, basal part of antenna; E, right mandible; F, outer lobe of maxillula; G, maxilla; H, maxilliped; I-O, pereopods 1-7; P-Q, pleopod 1-2; R, uropod.

12 setae on outer margin; ischium with 12 setae; merus $\frac{2}{3}$ as long as ischium, with 15-16 setae on inner margin; carpus 2.3 time longer than merus, with 24-25 long setae including a plumose setae on inner margin; propodus as long as carpus, with more than 38 long setae on inner margin; dactylus small, without claw.

Pereopod 2-4 long and slender, with many long setae. Pereopod 2 (Fig. 8J): basis 1.8 times as long as wide, with a protuberance and three setae on inner margin; ischium square, with five long setae; merus 3.5 time longer than ischium, with more than 13 setae on inner area; carpus 1.2 times longer than merus, with more than 13 long setae on inner margin; propodus as long as carpus, with 11-

12 setae on inner margin; dactyls small, with a claw.

Pereopod 3 (Fig. 8K) a little longer than the pereopod 2: basis 3.7 times as long as wide, with six setae on inner margin; ischium, about 1/3 as long as basis, with six setae on inner margin; merus 3.8 times longer than ischium, with five longer setae and more than 20 shorter setae on inner margin; carpus as long as merus, with 15 to 16 long setae and several shorter setae on inner margin; propodus as long as carpus, with six to seven long setae on inner margin; dactylus small with a claw.

Pereopod 4 (Fig. 8L) 1.1 times longer than pereopod 3; basis five times as long as wide, with three setae on distal area of inner margin; ischium, less than 2/5 as long as basis, with four long setae on inner margin; merus twice longer than ischium, with 19–20 long setae on inner margin; carpus 1.2 times longer than merus, with nine to ten setae on inner margin; propodus as long as carpus, with 18 to 20 long setae on inner margin; dactylus small with a claw.

Pereopod 5 (Fig. 8M): basis rectangular, 4.7 times as long as wide, with nine to ten setae on outer margin and a small protrusion on outer margin; ischium 45 % as long as basis, with many relatively short setae on inner margin; merus 2/5 as long as ischium, with much hair on inner margin; carpus 1.4 times longer than merus, with two setae on outer distal area; propodus 1.7 times longer than carpus, with several short setae on both margins; dactyls with two claws.

Pereopod 6 (Fig. 8N) similar to pereopod 5 but a little shorter than the fifth: basis 2.6 times as long as wide, with three plumose setae and three simple setae on outer margin; ischium, less than half the length of basis; merus square, with much hair on inner margin and two setae on outer margin; carpus square, with much hair on inner side and two setae on outer margin; propodus 1.8 times longer than carpus, with six to seven setae on outer margin; dactylus bifid.

Pereopod 7 (Fig. 8O) a little shorter than the sixth: basis 1.4 times as long as wide, with six setae on basal half of outer margin; ischium less than half the length of basis; merus square; carpus square, with four setae on inner side; propodus rectangular and 2.2 times longer than carpus, with seven setae on inner margin; eight to nine setae on outer margin and three setae at outer distal area; dactylus bifid.

Pleopod 1 (Fig. 8P): basis rectangular, with four setae. Both rami thin, with five to six setae on distal area.

Pleopod 2 (Fig. 8Q): basis rectangular, with four setae; both rami rectangular, broadening toward the distal margin, with 15–16 setae on distal margin.

Uropod (Fig. 8R): basal terminal segment round; exopod short and with two long setae.

Etymology: “scaber” means “scabby” in Latin.

Remarks: The present new species is also allied to *Neastacilla richardosonae* Kussakin, 1982 reported from the sea of Japan, but the former is separated from the latter in the following features: (1) smaller granules on dorsal surface, (2) absence of remarkable antennae, (3) less remarkable epimera on pereonal and (4) smaller eyes.

Neastacilla tanakai Nunomura, 2004 [Jn.: Taoyame himenanafushi]

Materials examined: 10 ♂, 5 ♀, off Shimoda-shi, coll. Masakazu Aoki and Katsuhiko Tanaka, 7 May, 1997; 1 ♂, off Kisami, 45 m in depth 18 Aug. 1999, coll. Katsuhiko Tanaka; 11 ♂, 2 ♀, off Kisami, Shimoda-shi, 24 Nov. 1999, coll. Katsuhiko Tanaka.

Family Chaetillidae

Symmius caudata Richardson, 1904 [Jn.: Yaribo-heramushi]

Material examined: 2 ♂, 3 ♀, off Tateyama-shi, 34°52'N, 139°38'E–34°51'N, 139°39'E, 487–474 m in depth (St. 43), 25 Oct. 2002 by T/V *Shi'nyo-maru*; 4 ♂, 5 ♀, off Tateyama-shi, 34°52'N, 139°38'E–34°51'N, 139°38'E, 500–519 m in depth (St. 44) 25 Oct. 2002; 2 ♂, 14 ♀, by dredge off Shimoda-shi, 18 May, 1994; 1 ♂, 4 ♀, off Kisami, 45 m in depth, 18 Aug. 1999, coll. Katsuhiko Tanaka; 5 ♀, off Shimoda-shi, 12 Aug. 1994, coll. Katsuhiko Tanaka.

Symmius planus Nunomura, 1984 [Jn.: Hirata-yaribo-heramushi]

Material examined: 1 ♀, 2.5 km W.N.W off Jogashima, 65–75 m in depth, 13 Feb. 1965, Showa Memorial Institute, NSMT; 1 ♀, Kannonzuka-dahsi to Maruyama-dashi, Amadaiba, Sagami Bay, 86 m in depth, 17 June, 1965, Showa Memorial Institute, NSMT; 1 ♂, Kannonzuka-dahsi, Sagami Bay, 71 m in depth, 19 June 1966, Showa Memorial Institute, NSMT.

Family Idoteidae

Idotea metallica Bosc, 1802 [Jn.: Nagaremo-hrea mushi]

Material examined: 10 exs, off Isshiki, Hayama, Sagami Bay, Upper layer, 18 June, 1956, Showa Memorial Institute, NSMT; 5 ♀, from drift weed, off Shimoda-shi, 12 Aug. 1994, coll. Katsuhiko Tanaka.

Idotea ochotensis Brandt, 1851 [Jn.: Ohotsku-heramushi]

Material examined: 1 ♂, from drift sea weeds, off Shimoda, 7 July, 1993, coll. Masakazu Aoki.

Synisoma pacificum Nunomura, 1974 [Jn.: Kuroshio-naga-heramushi]

Material examined: 1 ♂, 3 ♀, on Sargassum bed, Nabeta Bay, 25 May, 1993, coll. Masakazu Aoki; 2 ♀, 17 May, 1994; 3 ♀, Nabeta Bay, 1994, coll. Katsuhiko Tanaka.

Synidotea hikigawaensis Nunomura, 1974 [Jn.: Herikirewaraji-heramushi]

Material examined: 1 ♂, Tenjinjima, Sajima, Yokosuka-shi, 17 May, 2003, coll. Noboru Nunomura; 1 ex, 14 June, 1968; 1 ♀, off Shimoda, 7 May, 1997, coll. Katsuhiko Tanaka; 1 ♂, 3 ♀, off Kisami, 24 Nov. 1999, coll. Katsuhiko Tanaka; 1 ♀, off Kisami, 27 Aug. 1997, coll. Masakazu Aoki.

Synidotea laevidorsalis (Miers, 1881) [Jn.: Waraji-heramushi]

Material examined: 26 exs, Tanoura, Suzaki, Shimada-shi, 16 June, 1972, Showa Memorial Institute, NSMT; 1 ex, Kurosaki, Sagami Bay, 14 June, 1968, Showa Memorial Institute, NSMT; Kasima, Hayama, Sagami Bay, 3.6–5.4 m in depth, Showa Memorial Institute, NSMT; 2 ♀, off Kisami, 27 Aug. 1997, coll. Masakazu Aoki.

Paridotea munda Nunomura, 1988 [Jn.: Kindachi-heramushi]

Material examined: 26 exs, Tanoura, Suzaki, Shimoda-shi, 16 June, 1972; 1 ♂, Nabeta, 11 May, 1994 coll. Katsuhiko Tanaka.

Pentias namikawai n. sp. [New Jn.: Hosomi-heramushi]

(Fig. 9)

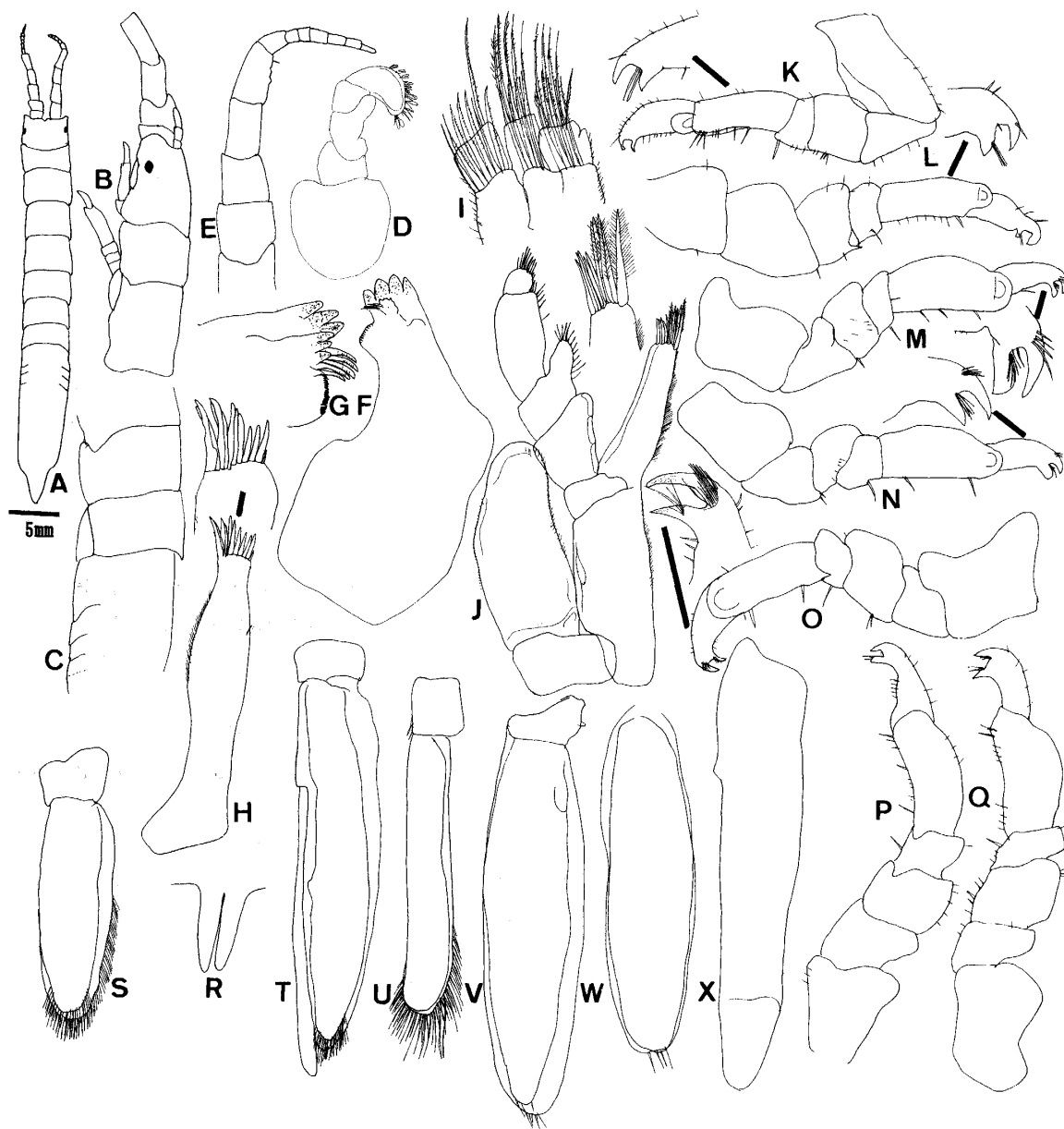


Fig. 9. *Pentias namikawai* n. sp. (male, holotype). A, dorsal view; B, lateral view of anterior margin; C, lateral view of ; D, antennule; E, antenna; F, right mandible; G, left mandible; H, outer lobe of maxillula; I, maxilla; J, maxilliped; K, pereopod 1 (the boundary between carpus and merus is omitted); L-Q, pereopods 2-7; R, penes; S-V, pleopods 1-5; X, uropod.

Material examined: 2 ♂, (1 ♂, holotype, 36.5 mm in body length and a paratype 38.1 mm), rocky shore, Kurosaki, Miura-shi, Sagami Bay, 12 June, 1968. Type series is as follows : Holotype (NSMT-Cr S35) and a paratype (NSMT-Cr S36).

Description: Body 7.8 times as long as wide, Color dull yellow in alcohol. A longitudinal short color line across the both eyes. Cephalon anterior margin only slightly concave. Pereonal somites 2-5 subequal in length and pereonal somites 1, 6-7 slightly shorter than the other four somites. Epimera well developed. Pleonal somites with three pairs of suture lines on lateral margin. Pleotelson: basal

area parallel; apical area pointed.

Antennule (Fig. 9D) five-segmented and reaches half the length of the third peduncular segment; segment 1 big and round; segment 2 and 3 rectangular; terminal segment 14–15 aesthetascs and more than 10 setae around the margin. Antenna (Fig. 9E), relatively short, composed of five peduncular segments and seven flagellar segments.

Right mandible (Fig. 9F): pars incisiva 4-toothed; lacinia mobilis weakly 3-toothed; 3–4 setae. Left mandible (Fig. 9G): pars incisiva 3-toothed; lacinia mobilis 3-toothed; 4 setae; processus molaris wide. Maxillula (Fig. 9H) with 10 teeth at the tip of outer lobe. Maxilla (Fig. 9I) inner lobe with eight setae on inner lobe; both rami with more than 10 setae. Maxilliped (Fig. 9J): endite with 10 setae at the tip; inner five teeth plumose setae and outer simple setae. Palp five-segmented, with segment 3 protruded distally, long segment 4 and semicircular segment 5; epipodite lanceolate.

Pereopod 1 (Fig. 9K): basis stout and rectangular, with seven to eight short setae on inner margin; ischium a little wider than long; merus almost square and 0.7 times as long as ischium; carpus shorter than merus; propodus rectangular, with eight setae on inner margin; dactylus with a bundle of two setae.

Pereopod 2 (Fig. 9L): basis stout and almost square; ischium a little wider than long; merus 4/7 as long as ischium; carpus short; propodus rectangular, with eight setae on inner margin; dactylus with a bundle of relatively long setae.

Pereopod 3 (Fig. 9M): basis stout, bobbin-shaped; ischium wider than long; merus almost square; carpus shorter than merus; propodus rectangular, with three setae on inner margin; dactylus with a bundle of relatively long setae.

Pereopod 4 (Fig. 9N): basis stout, bobbin-shaped; ischium 3/5 as long as basis; merus half the length of ischium; carpus shorter than merus; propodus 1.2 times longer than basis; dactylus, with half a dozen setae at the base of claw.

Pleopod 5 (Fig. 9O): basis stout, bobbin-shaped; ischium wider than long; merus almost square, with two setae on inner margin; carpus short, with a seta on inner margin; propodus 2.5 times as long as carpus, with two setae on inner margin; dactyls with two groups of six to twelve setae.

Pereopod 6 (Fig. 9P): basis rectangular; ischium 2/3 as long as basis; merus almost square; carpus shorter than merus; propodus rectangular, with more than eight setae on inner margin; dactylus with a bundle of relatively long setae.

Pereopod 7 (Fig. 9Q): basis rectangular, 2/5 as long as basis; ischium wider than long; merus almost square; carpus about half the length of merus; propodus rectangular, with about ten setae on inner margin; dactylus with a bundle of relatively long setae.

Penes (Fig. 9R) paired and parallel.

Pleopod 1 (Fig. 9S): both rami lanceolate, with many setae on the distal area.

Pleopod 2 (Fig. 9T): both rami lanceolate, with many setae on the distal area but endopod a little longer than exopod; stylus exceeds beyond both rami and slightly broadens toward the tip.

Pleopod 3 (Fig. 9U): both rami rectangular, with many setae on the distal area

Pleopod 4 (Fig. 9V): lanceolate, with several setae.

Pleopod 5 (Fig. 9W): lanceolate a little shorter than pleopod 4, with a few of setae.

Uropod (Fig. 9X) uniramous, basal segment longer than the distal one.

Etymology: The species name is dedicated to Dr. Hiroshi Namikawa (NSMT) who promoted the present project.

Remarks: Hitherto, three species of the genus *Pentias* have been recorded as valid. The present new species is closely allied to *Pentias hayi* reported from Hakodate, but the former is separated from the latter in the following features: (1) slightly narrower body parallel lateral border of pereonal somite, (2) more protruded posterior part of pleotelson, (3) small concavity on the anterior margin of cephalon, (4) smaller eyes, (5) less remarkable epimera of pereonal somites and (6) numerous flagella of antenna. Nunomura (1988) reported an undescribed species of the genus from Hiraiso, Nakaminato-shi, Ibaraki-ken, central Japan, and the present new species is also allied to the species but the former is separated from the latter in the following features: (1) longer body, (2) less numerous segments of antennule, (3) numerous setae of maxilla and (4) strongly protruded apical area of pleotelson.

***Cleantiella isopus* (Grube, 1883) [Jn.: Iso-heramushi]**

Material examined: 2 ♀, North of Araiama, Koajiro, Misaki, Miura-shi, 16 May, 2003, coll. Noboru Nunomura; 2 ♂, 2 ♀, Aburatsubo, Koajiro, Misaki, Miura-shi, 16 May, 2003, coll. Noboru Nunomura; 2 ♂, 4 ♀, 1 gravid ♀, 1 young, Tenjinjima, Sajima, Yokosuka-shi, 17 May, 2003, coll. Noboru Nunomura; 1 ex, 22 July, 1959; 1 ex, Kurosaki, Sagami Bay, 23 July, 1959; 1 ♀, from colonies of calcareous algae, Nabeta, Oura, Shimoda-shi, 9 May, 1993, coll. Masakazu Aoki; 1 ♂, 1 ♀, Nabeta, 28 Apr. 1998, coll. Noboru Nunomura; 1 ♀, Nabeta, 29 Apr. 1998, coll. Noboru Nunomura; 2 ♂, 1 ♀, 1 ovig. ♀, Okada-naene, Oshima, 7 May, 2004, coll. Noboru Nunomura; 5 ♂, 7 ♀, Tsumeki-zaki, Shimoda-shi, 25 May, 2005, coll. Noboru Nunomura; 1 ♀, Imaihama, Kawazu, 26 May, 2005, coll. Noboru Nunomura; 1 ♀, 26 May, 2005, coll. Noboru Nunomura; 2 ♂, 2 ♀ including 1 ovig. ♀, Okada-naene, Oshima, 7 May, 2004 coll. Noboru Nunomura; 1 ex, in shallow water, Arasaki, Sagami Bay, 22 July, 1959, Showa Memorial Institute, NSMT; 1 ex, shallow Kurosaki, Sagami Bay, 23 July, 1959, Showa Memorial Institute, NSMT.

***Cleantiella strasseni* (Thielemann, 1910) [Jn.: Ohiraki-heramushi]**

Material examined: 1 ex, Warijima, Sagami Bay, 26 July, 1963, by the Biological Laboratory, Imperial Household; 1 ex, Tanoura, Suzaki, Izu Peninsula, 15 June, 1972, coll. by the Biological Laboratory, Imperial Household; 2 exs, Tanoura, Suzaki, Izu Peninsula, 16 June, 1972, coll. by the Biological Laboratory, Imperial Household; 1 ♀, Inter-tidal zone, Suzaki, 3 Apr. 1996; 1 ♀, off Shimoda-shi, 18 May, 1994; 1 ♂, off Kisami, Shimoda-shi, 50 m in depth, coll. Katsuhiko Tanaka.

***Cleantoides planicauda* Benedict, 1899 [Jn.: Hoso-heramushi]**

Material examined: 1 ♂, off Nagai, 12 July, 1955, coll. by the Biological Laboratory, Imperial Household; 2 ♀, Nabeta on the sea weed *Zostera marina*, 17 July, 1993, coll. Masakazu Aoki; 2 ♀, 1 young, trawl off Nabeta, 14 June, 1994; off Kisami, Shimoda-shi, 27 Apr. 1996; 3 ♀, Nabeta, June, 1994, coll. Masakazu Aoki.

Suborder Flabellifera

Family Cirolanidae

***Cirolana albicauda* Nunomura, 1985 [Jn.: Ojiro-sunahorimushi]**

Material examined: 1 ♀, off Odawara, 35°1.2'N, 139°12'E–35°1.3'N, 139°12'E, 269–247 m in depth (St. 20), 23 Oct. 2002.

Cirolana harfordi japonica Thielemann, 1910 [Jn.: Nise-sunahorimushi]

Material examined: 1 ♂, Tsumeki-zaki, Shimoda-shi, 25 May, 2005, coll. Noboru Nunomura; 1 ♀, Imaiama, Kawazu, 26 May, 2005, coll. Noboru Nunomura; 1 ♀, Inatori, Higashi-izu, 26 May, 2005, coll. Noboru Nunomura; 1 ♂, 4 ♀, Tanohama, Izu Oshima, 9 May, 2004, coll. Noboru Nunomura; 1 ♂, 5 ♀, Ryuzaki, Habu, Oshima coll. Noboru Nunomura; 1 ♀, Kurone, Nijima, 6–7 May, 2004, coll. Noboru Nunomura; 1 ♂, 10 ♀, from dead fishes at Isshiki, Hayama, 20 Jan. 1958, Showa Memorial Institute, NSMT; 1 young, Usami, Itoh-shi, 26 May, 2005, coll. Noboru Nunomura; 1 ♂, 1 ♀, inter-tidal zone of Taushi, 19 June, 2000, coll. Katsuhiko Tanaka.

Excirrolana chiltoni Richardson, 1902 [Jn.: Hime-sunahorimushi]

Material examined: 1 ♂, 9 ♀, Katase, Fujisawa-shi, 25 Oct, 2004, coll. Noboru Nunomura; 1 ♂, Imaiama, Kawazu, 26 May, 2005, coll. Noboru Nunomura; 2 ♂, 11 ♀, on the dead fish, *Plotosus lineatus* (Thunberg), Nabeta, 7 June, 1994, coll. Katsuhiko Tanaka.

Eurydice longiantennata Nunomura & Ikehara, 1985 [Jn.: Higenaga-sunahorimushi]

Material examined: 2 ♀, off Kisami, 8 May, 1994, coll. Katsuhiko Tanaka.

Natatolana japonensis (Richardson, 1904) [Jn.: Yamato-sunahorimushi]

Material examined: 1 ♀, 35°1.2'N, 139°12'E–35°1.3'N, 139°12'E, 269–247 m in depth (St.20), 23 Oct. 2002.

Bathynomus doederleini Ortmann, 1895 [Jn.: Ougushokumushi]

Material examined: 1 ex, off Hayama, 13 Mar. 1968, coll. by the Biological Laboratory, Imperial Household; 1 ex, off Kurihama, 15 June, 1968, coll. by the Biological Laboratory, Imperial Household; 1 ex, Kurihama Sagami Bay, 15 June 1968 by the Biological Laboratory, Imperial Household; 1 ex, off Kurihama, 15 June, 1968, coll. by the Biological Laboratory, Imperial Household.

Tridentellidae

***Tridentella takedai* n. sp.** [New Jn.: Sunahorimushi-damashi]

(Fig. 10)

Material examined: 4 ♂ (1 ♂, holotype, 10.1 mm in body length and 3 ♂, paratypes, 7.0–7.3 mm in body length) and 4 ♀ (1 ♀, allotype 7.5 mm in body length and 3 ♀, paratypes, 6.3–7.1 mm in body length), off Arasaki, Yokosuka-shi, 35°11. 03'N, 139°34.93'E–35°11.02'N, 139°35.02'E, 67–60 m in depth (St. 2), by F/B *Aokimaru* No. 2, 8 Mar, 2002. Type series is as flows: Holotype (NSMT-Cr S37), allotype (NSMT-Cr S38), 3 paratypes (NSMT-Cr S39) and 3 paratypes (TOYA Cr- 12138–13140).

Description of male: Body 2.3 times as long as wide. Color dull yellow in alcohol. Cephalon with a small protrusion at the medial part of anterior margin. Eyes mediocre in size, each eye composed of 27–30 ommatidia. Pereonal somites 4–6 slightly longer than the pereonal somites 1–3. Pereonal somite 7 about half the length of pereonite 6. Epimera of pereonal somites 4–7 well developed. Pleonal somites short. Pleotelson triangular, with rounded medial posterior end.

Antennule (Fig. 10C): peduncle three-segmented; flagellum nine-segmented with a bundle of aesthetascs at the tip. Antenna (Fig. 10D): peduncle five-segmented, terminal two segments longer

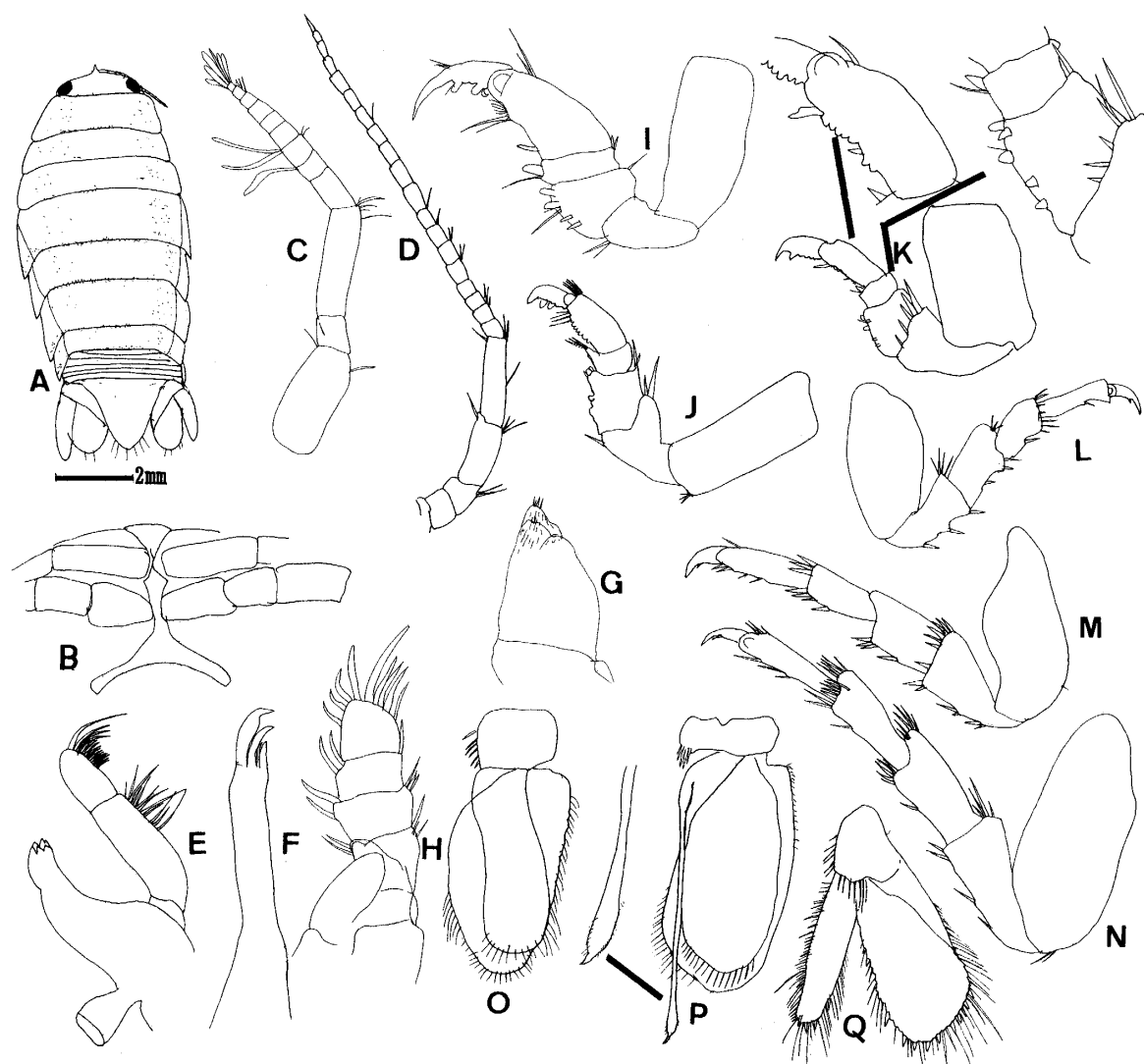


Fig. 10. *Tridentella takedai* n. sp. (male, holotype). A, dorsal view; B, ventral view of anterior part of cephalon; C, antennule; D, antenna; E, mandible; F, maxillula; G, maxilla; H, maxilliped; I-M, pereopods 1-5; N, pereopod 7; O, pleopod 1; P, pleopod 2; Q, uropod.

than the basal three segments, flagellum 18-20 segmented. Frontal lamina and clypeus (Fig. 10B) narrow. Mandible (Fig. 10E): pars incisiva three-toothed; lacinia mobilis three-toothed; processus molaris long and round; palp three-segmented, second segment long, with 12 setae and terminal segment rather short with 15-16 setae including a distal longer one. Maxillula (Fig. 10F) slender, with two larger recurved teeth and two smaller teeth at the tip. Maxilla (Fig. 10G) small, with many small setae. Maxilliped (Fig. 10H): endite round; palp well developed; palpal segments 2-4 with two or three setae on both margins; terminal palpal segment with nine to ten setae around the margin; epipodite elliptical.

Pereopod 1 (Fig. 10I): basis twice as long as wide; ischium half the length of basis, with two setae at inner distal angle; merus with four protuberances and a seta on inner margin and a seta on outer margin; carpus short, with a protuberance and a seta on inner margin and two setae on outer

margin; propodus stout, with a protuberance and two setae on inner margin, a group of shorter setae at distal inner area and two setae on outer margin; dactylus with two protuberances on inner margin.

Pereopod 2 (Fig. 10J): basis rectangular, 2.5 times as long as wide, with three short setae at inner distal angle; ischium broadens towards the tip, with a seta on inner distal area and two setae on outer distal area; merus with two or three peg-like setae on inner margin and two setae on outer distal area; carpus short, with three setae on inner distal area; propodus with sinuate margin and four setae on distal half of inner margin.

Pereopod 3 (Fig. 10K): basis rectangular, about twice as long as wide; ischium, broadening towards the tip, with five setae on distal margin; merus with four peg-like setae and a seta on inner margin; carpus short, with a seta on inner distal area; propodus with sinuate margin and two to three setae on distal margin; dactylus bifid with eight to ten setae and four setae on basal areas.

Pereopod 4 (Fig. 10L) a little longer than the preceding ones: basis rectangular, more than twice as long as wide; ischium about half the length of basis, with three setae on inner margin and four setae at outer distal area; merus $3/4$ as long as ischium, with three setae on inner margin and three setae at outer distal angle; carpus a little smaller than merus, with two or three setae on inner margin, and seven setae on distal margin; propodus with a seta on inner margins; dactylus bifid.

Pereopod 5 (Fig. 10M): basis stout and fusiform; ischium with six setae on inner margin and seven to ten setae on distal margin; merus with four setae on inner margin; carpus slender than merus, with four setae on inner margin and three setae on outer distal angle; propodus slender, with five setae on inner margin and a seta on outer distal margin; dactylus bifid.

Pereopod 6: basis fusiform, 2.5 times as long as wide; ischium half the length of basis, with a few of setae on inner distal angle and five to six setae on outer distal angle; merus almost as long as ischium, with four to five setae on inner distal angle and four to six setae on outer distal angle; carpus $4/5$ as long as merus, with a or two setae on inner margin; propodus a little longer than merus, with nine to ten setae on inner margin and three setae at outer distal area; dactylus bifid, with a small short setae on outer margin.

Pereopod 7 (Fig. 10N): basis stout fusiform, 2.7 times as long as wide, with two setae on inner distal angle; ischium 0.6 times as long as basis, with four setae on inner margin and four setae at outer distal angle; merus with five setae on inner distal angle and six setae on outer distal angle; carpus 13–14 setae on distal margin; propodus slender, with three setae on inner margin and four setae on outer distal margin; dactylus bifid.

Penes short. Pleopod 1 (Fig. 10O): basis rectangular, with 6–7 setae on inner margin; endopod rectangular, with many setae on outer margin; exopod slender, with 15–17 setae on distal margin.

Pleopod 2 (Fig. 10P): basis rectangular, with five setae on inner margin; stylus exceeds beyond rami, distal area swollen, but the apical area slender; both rami rectangular, but outer lobe slightly smaller than endopod than outer ones.

Uropod (Fig. 10Q): basis triangular; endopod lanceolate, with 12 spines, about 40 plumose setae and sinuate margin; exopod narrow-lanceolate, with five spines, about 80 plumose setae.

Female: Differs from male in sexual characters and less numerous flagellar segment antennules.

Etymology: The species is dedicated to Dr. Masatsune Takeda of NSMT, who promoted the project and reader of carcinology and systematic zoology in Japan.

Remarks: The present new species is allied to *Tridentella japonica* Thielemann, 1910 reported from deep sea of Sagami Bay, but the former is separated from the latter in the following features: (1)

triangular pleotelson, (2) numerous flagellar segments of antennae and (3) narrower clypeus. I happened to find a juvenile of parasitic isopod attaching to the ventral site of anterior part of pereon.

Family Aegidae

Rocinela angustata Richardson, 1904

(Fig. 11)

Rocinela laticauda Richardson (not Hansen), 1899, p. 827. Proc. Am. Philos. Soc., 37, pp 14–15, fig 5–6; Richardson, 1898, p. 14, figs. 5–6.

Rocinela angustata Richardson, 1904, p. 33 (Manazuru); Thielemann, 1910, p. 31 (Manazuru); Kussakin, 1979b, p. 120 (Okhotsk Sea, 120–920 m deep).

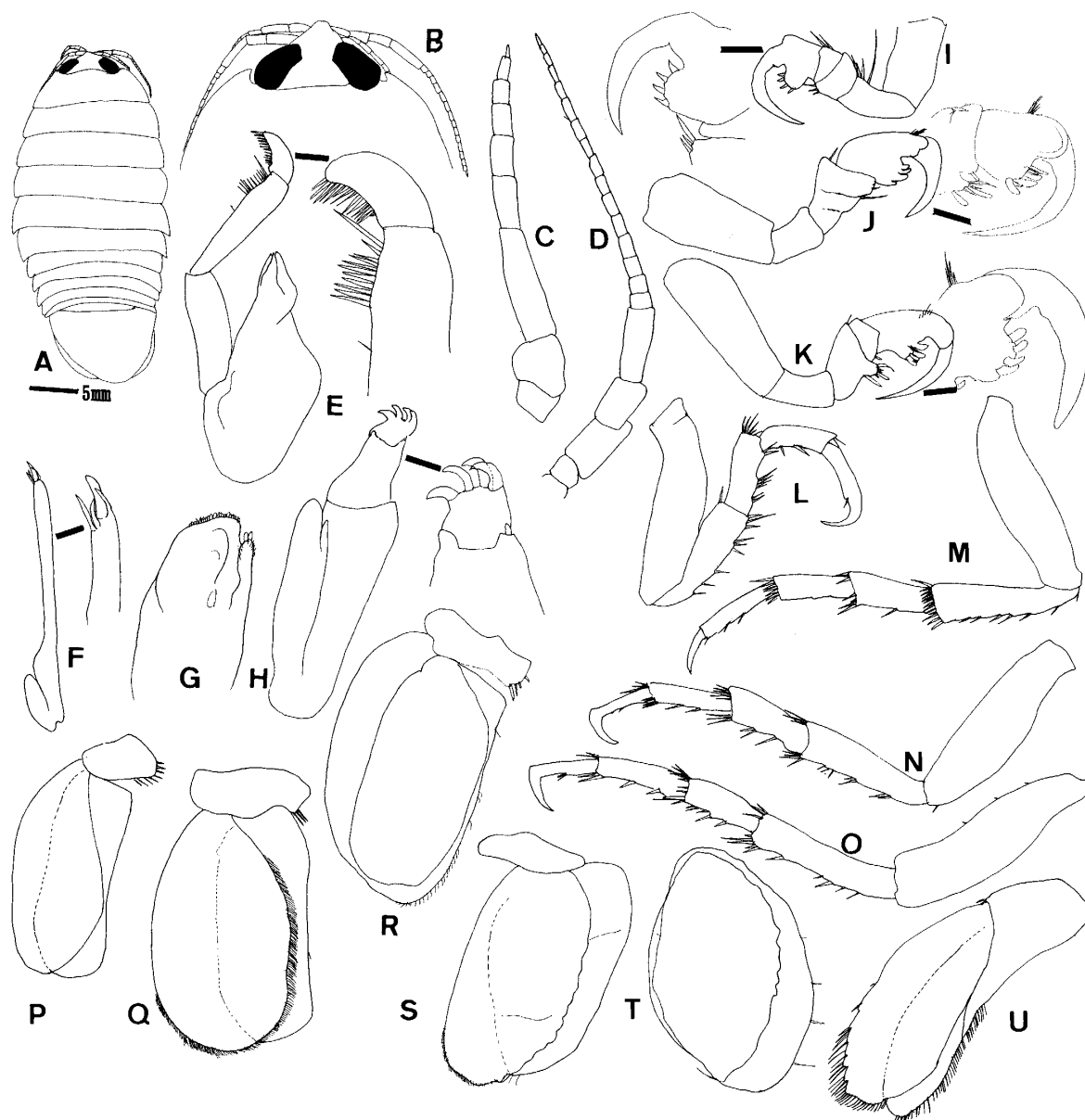


Fig. 11. *Rocinela angustata* Richardson, 1898 (a specimen from "Amadaiba"). A, dorsal view; B, cephalon; C, antennule; D, antenna; E, mandible; F, maxillula; G, maxilla; H, maxilliped; I–O, pereopods 1–7; P–T, pleopods 1–5; U, uropod.

Material examined: south of Aoyamadashi, Amadaiba, off Arasaki, Yokosuka-shi, 25 Aug. 1950.

Description of female: Body 2.1 times as long as wide; fifth pereonal somite widest. Color dull yellow in alcohol. Cephalon triangular, with a blunt but protruded medial process on anterior margin. Eyes relatively large, each eye with 60–70 ommatidia. Pereonal somites subequal in length. Pleonal somites well defined. Pleotelson (Fig. 11 A) semicircular.

Antennule (Fig. 11C) composed of nine segments. Antenna (Fig. 11D) composed of five peduncular segments and 16 flagellar segments. Mandible (Fig. 11E): pars incisiva with three teeth; second palpal segment with 11 setae on distal half; terminal segment with 15 setae. Maxillula (Fig. 11F) slender, with four teeth including a stronger one at the tip. Maxilla (Fig. 11G) wide: inner lobe with 2 small teeth; outer lobe wide, with more than about 25 small tufts on dorsal border. Maxilliped (Fig. 11H): terminal segment with four recurved teeth.

Pereopod 1 (Fig. 11I): basis rectangular, 1.9 times as long as wide; ischium a little shorter than basis, with four long setae on outer margin; merus rectangular, with three setae on inner margin; carpus short and triangular, with two setae on outer margin; propodus relatively short, with roundly protruded basal half of inner margin, bearing four stout setae on it; dactylus recurved and tapering toward the tip.

Pereopod 2 (Fig. 11 J): basis rectangular, 2.2 times as long as wide, ischium $2/5$ as long as basis; merus almost square; carpus with a seta at outer distal area; propodus with a protuberance at middle part of inner margin, bearing four teeth on it; dactylus recurved and tapering toward the tip.

Pereopod 3 (Fig. 11K): basis rectangular, 2.8 times as long as wide; ischium $2/5$ as long as basis; merus with a protruded inner distal area, bearing five to six setae on it; carpus short and pentagonal; propodus with a protuberance at middle part of inner margin, bearing four short setae on it; dactylus recurved and tapering toward the tip.

Pereopods 4–7 long and similar in shape. Pereopod 4 (Fig. 11L): basis 4.1 times as long as wide; ischium $2/3$ as long as basis, with nine to ten setae on inner margin and a seta at outer distal angle; merus $3/5$ as long as ischium, with eight setae on inner margin and six setae on outer distal area; carpus $5/6$ as long as merus, with three setae on inner margin and two or three setae on distal margin; propodus as long as carpus; dactylus recurved but a little shorter than of the preceding ones.

Pereopod 5 (Fig. 11M): basis 3.8 times as long as wide; ischium $3/4$ as long as basis, with six to seven setae on inner margin and more than 13 setae on distal margin; merus half the length of ischium, with a seta on inner margin and six setae at outer distal area; carpus as long as merus, with two setae on inner margin and six setae on distal margin; propodus a little shorter than carpus; dactylus recurved but a little shorter than of the preceding ones.

Pereopod 6 (Fig. 11N): basis 4.0 times as long as wide; ischium $7/10$ as long as basis, with eight to ten setae on inner margin, four or five setae at inner distal angle and three to four setae at outer distal angle; merus half the length of ischium, with five setae on inner margin and eight to ten setae at outer distal margin; carpus as long as merus, with two setae on inner margin and six to seven setae on distal margin; propodus a little shorter than carpus; dactylus recurved and rather short.

Pereopod 7 (Fig. 11O): basis 3.6 times as long as wide; ischium $5/8$ as long as basis, with four setae on inner margin, four to five setae at inner distal angle and three setae on outer distal angle; merus half the length of ischium with two groups of one to two setae on inner margin and three to five setae at inner distal angle and outer distal angle; carpus a little longer than merus, with two setae on inner margin and three to five setae at inner distal angle and outer distal angle; propodus a little

shorter than carpus, with three to five setae at inner distal angle and outer distal angle; dactylus recurved and rather short.

Pleopod 1 (Fig. 11P): basis rectangular, with 10 setae on lateral margin; both rami lanceolate.

Pleopods 2–5 (Figs. 11Q–T): both rami rectangular.

Uropod (Fig. 11U): basis pentagonal; endopod fusiform, with seven to eight incisions on distal half and with many setae around the margin; exopod fusiform, with many setae around the margin

Remarks: The present specimen agree with the original description and Kussakin's redescription but the present specimen shows the following differences from them; (1) less numerous segmentation of antennule, (2) stronger incision on outer margin of exopod of uropod, (3) numerous setae on merus of pereopod 2 and (4) less numerous setae of outer distal area of carpus of pereopod 1.

Family Cymothoidae

Ceratothoa oxyrhanchaenus (Koelbel, 1879) [Jn.: Tainoe]

Material examined: 1 ♀, off Hayama, Sagami Bay, 12 Feb. 1963, coll. by the Biological Laboratory, Imperial Household.

Ceratothoa curvicauda n. sp. [New Jn.: Namio-uono-e]

(Figs. 12, 13)

Material examined: 2 ♂ (1 ♂, allotype, 18.6 mm in body length and 1 ♂, paratype, 11.8 mm in body length) and 21 ♀ (1 ♀, holotype, 29.1 mm in body length and 20 ♀, paratypes, 22.2–30.1 mm in body length) from the host, carangid fish *Pseudocaranx dentax* (Bloch et Schneider), *Decapteris muroadi* (Temminck et Schlegel), 14 May, 2003, coll. Masami Watanabe. Type series is as follows: holotype (NSMT-Cr S40), allotype (NSMT-Cr S41), 5 paratypes (NSMT-Cr S42), 5 paratypes (TOYA Cr-13141–13145), and 5 paratypes (HSM-cri-0013–0017) at Hayama Shiosai Museum.

Description of female: Body 2.7 times as long as wide, almost parallel. Pereonite widest; twisted to the right or left. Cephalon triangular and shallowly immersed in pereonal somite 1. Color dull yellow in alcohol, without obvious chromatophores. Eyes small, each eye with about 60 ommatidia. Pereonal somite 1 narrowest but longest. Pereonal somites 2–5 subequal in length. Pereonal somites 4–5 widest. Pereonal somite 6 a little shorter than 5th; pereonal somite 7 short and narrow. All the pleonal somites subequal in length. Pleotelson: posterior margin sinuate, with a pair of concaved areas.

Antennule (Fig. 12 B) seven-segmented. Antenna (Fig. 12 C) nine-segmented. Mandible (Fig. 12D): palp three-segmented, without any teeth and spines; terminal segment with four small spines. Maxillula (Fig. 12E) with four terminal spines. Maxilla (Fig. 12 F): inner lobe with 4–5 spinules; outer lobe 6–8 spinules. Maxilliped (Fig. 12 G); terminal segment small, with four teeth at the tip.

All the pereopods (Figs. 12H–N) similar in shape: basis stout; ischium a little shorter and narrower than basis; merus short, about 1/3 length of basis; carpus short; propodus stout; dactylus recurved and longer than propodus.

All the pleopods (Figs. 12 O–P) similar in shape: both rami round, with sinuate margin. Uropod (Fig. 12Q): basis rectangular, both rami lanceolate; exopod slightly larger than endopod.

Description of male: Body sides of body more or less parallel, with large tuberos shoulder-like structures on postero-lateral angles of pereonal segments. Color dull yellow.

Antennule (Fig. 13A) seven-segmented; basal part of both antennules contiguous. Antenna nine-segmented.

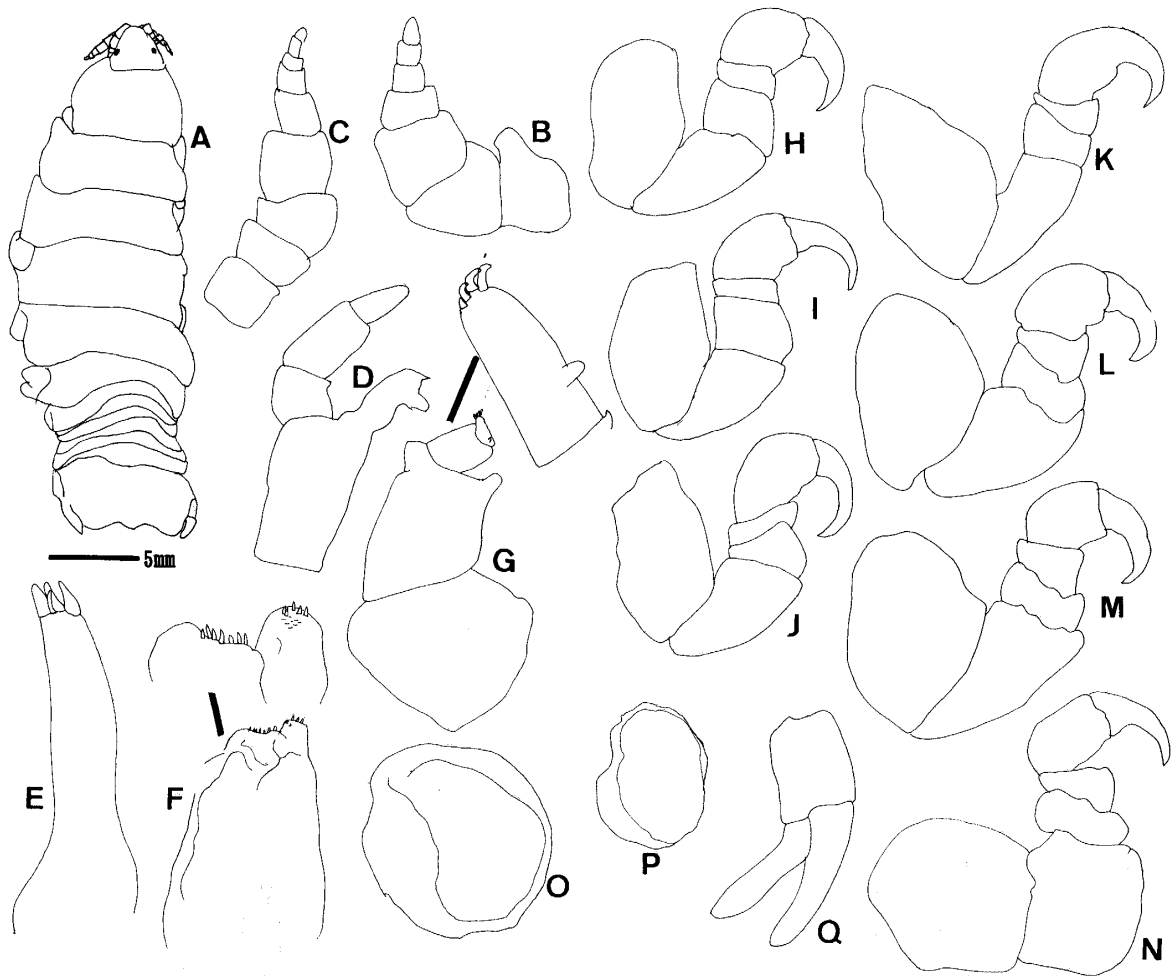


Fig. 12. *Ceratothoa curvicauda* n. sp. (female, holotype). A, dorsal view; B, antennule; C, antenna; D, mandible; E, maxillula; F, maxilla; G, maxilliped; H–N, pereopods 1–7; O, pleopod 1; P, pleopod 5; Q, uropod.

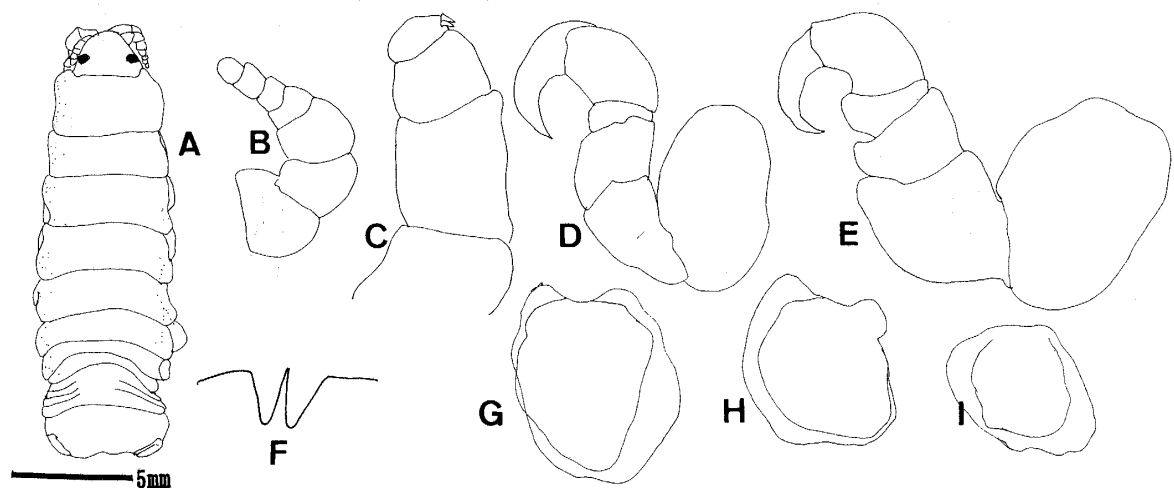


Fig. 13. *Ceratothoa curvicauda* n. sp. (male, allotype). A, dorsal view; B, antennule; C, maxilliped; D, pereopod 1; E, pereopod 7; F, penes; G–H, pleopods 1–2; I, pleopod 5.

Maxilliped (Fig. 13C) with two recurved teeth at the tip.

All the pereopods (Figs. 13D–E) similar in shape: basis stout; ischium a little shorter and narrower than basis; merus short, about 1/3 length of basis; carpus short; propodus stout.

Penes (Fig. 13F) paired, rather short and tapering toward the tip.

All the pleopod (Figs. G–I) similar in shape: both rami round, with sinuate margin. Pleopod 2 without stylus and similar to female.

Uropod basis rectangular, both rami lanceolate.

Etymology: The species name, “curvus” means “arched” in Latin + “cauda” means “tail” in Latin.

Remarks: Hitherto 29 species of the genus *Ceratothoa* have been known as valid. Among them, the present new species is allied to *C. trigonocephala* (Leach, 1818) reported from Japan and many countries but the former is separated from the latter in the following features: (1) shorter pleotelson, (2) sinuate posterior margin of the same, (3) wider pleonal somite 1, (4) numerous teeth on maxillula (5) longer pereonal somite 1 and (6) shorter antero-lateral angle of pereonal somite 1.

Family Sphaeromatidae

***Gnorimosphaeroma rayi* Hoestlandt, 1969 [Jn.: Iso-kotsubumushi]**

Materials examined: 1 ♂, Shimoda Port, date and collector unknown; 6 youngs, Taushi, Shimoda-shi, 19 June, 2000, coll. Katsuhiko Tanaka.

***Gnorimosphaeroma hoestlandti* Kim & Kwon, 1985 [Jn.: So-kotsubumushi]**

Materials examined: 1 ♂, 1 ♀, Tenjinjima, Sajima, Yokosuka-shi, 18 May, 2003, coll. Ken'ichiro Yamamoto; 1 ♂, north of Araiama, Koajiro, Misaki-cho, Miura-shi, 16 May, 2003, coll. Noboru Nunomura; 18 exs, north of Araiama, Koajiro, Misaki-cho, Miura-shi, 17 May, 2003, coll. Noboru Nunomura; 20 exs, Anakiriwan, Higashi-izu-machi, 26 May, 2005, coll. Noboru Nunomura; 32 exs. Hikimwashi, Kouzu Island, 6 May, 2004, coll. Noboru Nunomura; 4 ♂, 1 ♀, in shallow water, Nishino-saki, Sagami Bay, 20 July, 1963, coll. by the Biological Laboratory, Imperial Household; 2 ♂, 1 ♀, Kurosaki, Nishino-saki, Sagami Bay, 23 July, 1959, coll. by the Biological Laboratory, Imperial Household.

***Dynoides dentisinus* Shen, 1929 [Jn.: Shiriken-umisemi]**

Material examined: 1 ♀, north of Araiama, Koajiro, Miura-shi, 16 May, 2003, coll. Noboru Nunomura; 2 ♂, 1 ♀, Tenjinjima, Sajima, Yokosuka-shi, 18 May, 2003, coll. Ken'ichiro Yamamoto; 1 ♂, 3 ♀, Tsumeki-zaki, Shimoda-shi, 25 May, 2005, coll. Noboru Nunomura; 1 ♀, Ebisu-jima, Shimoda-shi, 25 May, 2005, coll. Noboru Nunomura; 1 ♂, 1 ♀, Nabeta, 29 Apr. 1998, coll. Noboru Nunomura; 10 ♀, Kurone, Niijima, 7 May, 2004, coll. Noboru Nunomura; 3 ♀, Habu, Ryuuzaki, Oshima, 8 May, 2004, coll. Noboru Nunomura; 2 ♀, Mitsuuishi, Manaduru-misaki, 4 May, 2004, coll. Noboru Nunomura; 1 ♂, 2 ♀, East coast of Kozu Island, 5 May, 2004, coll. Noboru Nunomura.

***Chitonosphaera lata* (Nishimura, 1968) [Jn.: Habahiro-kotubumushi]**

Material examined: 1 ♀, Usami, Itoh-shi, 12 May, 2005, coll. Noboru Nunomura; 25 exs, in the shore near Iwawarino-matsu, Kouzu-shima, 5 May, 2004, coll. Noboru Nunomura; 12 exs, Kurone, Niijima, 7 May, 2004, coll. Noboru Nunomura; 1 ♀, Taushi, Shimoda-shi, 19 June, 2000, coll. Katsuhiko Tanaka.

***Cymodoce japonica* Richardson, 1907 [Jn.: Nihon-kotsubumushi or Umisemi]**

Material examined: 2 ♂, 2 ♀, Tanoura, Suzaki, Izu Peninsula, 16 June, 1972, Showa Memorial Institute, NSMT; 1 ♀, in the shallow water of rocky shore, Sagami Bay, 22 June, 1966, Showa Memorial Institute, NSMT; 1 ♀, inter-tidal zone of Taushi, 19 June, 2000, coll. Katuhiko Tanaka.

***Holotelson tuberculatus* Richardson, 1909 [Jn.: Chibi-umisemi]**

Material examined: 1 ♂, Nabeta Bay, 4 June, 1996, coll. Tatsuhiko Tanaka.

***Holotelson longicauda* Nunomura, 2004 [Jn.: Onaga-umisemi]**

Material examined: 1 ♂ (holotype, 10.6 mm in body length), Shimoda, 4 Apr. 1996, coll. Katsuhiko Tanaka and 1 ♀ (allotype, 6.3 mm in body length), Nabeta Bay, 4 Apr. 1996.

***Dynamenella laticauda* Nunomura, 1999 [Jn.: Kanae-umisemi]**

Material examined: 5 ♂, 7 ♀, in the shore near Iwawarino-matsu, Kouzu Shima, 5 May, 2004, coll. Noboru Nunomura; 10 ♂, 12 ♀, Habu, Ryuuzaki, Oshima, 8 May, 2004, coll. Noboru Nunomura; 1 ♂, Aburatsubo, Misaki, 12 May, 2003, coll. Noboru Nunomura.

***Cymodocella nipponica* (Nishimura, 1969) [Jn.: Tsutsuo-umisemi]**

Material examined: 1 ex, Ebisujima, Suzaki, Shimoda-shi, 25 May, 2005, coll. Noboru Nunomura; 2 exs, Kozushima, 5 May, 2004, coll. Noboru Nunomura; 1 ♀, from calcareous algae, Nabeta, Shimoda-shi, 9 May, 1993, coll. Masakazu Aoki; 4 ♂, 1 ♀, near light house, Shimoda, 20 Mar. 1996, coll. Katsuhiko Tanaka.

***Leptosphaeroma gottschei* Hilgendorf, 1885 [Jn.: Hirata-umisemi]**

Material examined: 23 exs, north of Araiama, Koajiro, Miura-shi, 16 May, 2003, coll. Noboru Nunomura; 42 exs, Isshiki, Hayama-cho, 18 May, 2003; 15 exs, Habu, Oshima, 8 May, 2004, coll. Noboru Nunomura; 22 exs, Tsumeki-zaki, Shimoda-shi, 25 May, 2005, coll. Noboru Nunomura; 58 exs, Anakiri-wan, Higashi-izu-machi, 26 May, 2005, coll. Noboru Nunomura; 19 exs, Yumigahama, Minami-izu-cho, 29 Apr. coll. Noboru Nunomura; Oura, 28, Apr. 1998, coll. Noboru Nunomura; 5 ♀, inter-tidal zone of Yumigahama, Minami-izu, 4 June, 2001, coll. Katsuhiko Tanaka; 2 ♂, 14 ♀, Taushi, Shimoda, 19 June, 2000, coll. Katsuhiko Tanaka; 1 ♂, 2 ♀, Nabeta 28, Apr. 1998, coll. Noboru Nunomura; 22 exs, Yumigahama, Minami-izu-cho, 29 Apr. 1998; 58 exs, Okada-Naene, Oshima, 7 May, 2004, coll. Noboru Nunomura; 43 exs, Habu-ryuuzaki, Oshima, 8 May, 2004, coll. Noboru Nunomura.

Biogeography

A total of 44 species of marine isopod crustaceans are now known from the Sagami Sea. According to their present distributions, the species can be grouped in the following five categories:

1. The following 22 species are considered to be warmer elements: *Elaphognathia cornigera*, *Jaeropsis lobata*, *Synisoma pacificum*, *Synidotea hikigawaensis*, *Synidotea laevidorsalis*, *Paridotea munda*, *Cleantiella isopus*, *Cleantiella strasseni*, *Cleantoides planidauda*, *Cirolana albicauda*, *Cirolana harfordi japonica*, *Exchirolana chiltoni*, *Dynoides dentisinus*, *Cthionisphaera lata*, *Cymodoce japonica*, *Holotelson tuberculata*, *Dynamenella laticauda*, *Cymodocella japonica*,

Leptosphaeroma gottschei, *Gnoriosphaeorma rayi* and *Gnoriosphaeorma hoestlandti*.

2. *Idotea ochotensis* is considered to be northern elements. Genera *Neastacilla* and *Arcturus* are considered to be also relatively colder elements.

3. *Idothea metalica* is a cosmopolitan species.

4. The following 10 species are difficult to classify whether they are warmer elements or colder elements but are considered to be endemic to Japanese or western Pacific: *Gnathia nipponensis*, *Ananthura rigida*, *Paranthura japonica*, *Symmius caudata*, *Symmius planus*, *Eudydice longinatenenna*, *Natatolana japonensis*, *Bathynomus doelderleni*, *Rocinela angustalta*, and *Ceratothoa oxyrhynchaerus*.

5. Eleven species including eight new species described in this paper and *Amakusanthura aokii*, *Holotelson longicauda*, and *Neastacilla tanakai* have been reported only from the Sagami Sea.

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要 約

国立科学博物館がおこなった「相模灘およびその沿岸地域における動植物相の経時的比較に基づく環境変遷の解明」において採集された海産等脚目甲殻類、ならびに国立科学博物館つくば資料センターおよび富山市科学文化センターに所蔵されている海産等脚目甲殻類標本を調査した。

今回の調査は2003年から2005年の5月に筆者が3回にわたり、潮間帯の調査を行ったほか、ドレッジなどにより採集された標本を調査した。これらの結果、5亜目12科43種が確認された。うち *Cyathura sagamiensis* サガミスノウミナナフシ(新称), *Mesanthura cinctula* フタイロウミナナフシ(新称), *Arcturus hastatus* ヤリオオニナナフシ(新称), *Neastacilla spinifera* トゲヒメナナフシ(新称), *Neastacilla scabra* ツブツブヒメナナフシ(新称), *Pentias namikawai* ホソミヘラムシ(新称), *Tridentella takedai* スナホリムシダマシ(新称), *Ceratothoa curvicauda* ナミオウオノエ(新称)の8種を新種として記載した。これらの新種の完模式標本は国立科学博物館昭和記念筑波研究資料館に保管された。

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